

# NASA Contractor Report 178414, Part 2

SPACE SHUTTLE PHASE B WIND TUNNEL  
MODEL AND TEST INFORMATION

VOLUME 1 - BOOSTER CONFIGURATION

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PHASE B WIND TUNNEL MODEL AND TEST  
INFORMATION. VOLUME 1: BOOSTER CONFIGURATION  
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National Aeronautics and  
Space Administration

Langley Research Center  
Hampton, Virginia 23665



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\*Pages i and 1-385 published under separate cover as NASA CR-178414, Part 1.

# TEST GDHWT 247-0 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHID.	NO. OF RUNS	MACH NUMBERS
RC9002	BIW3T6-90V3	A 0	0	1
RC9003			-20	1
RC9004			-40	1
RC9005	BIW1T6-90V3		-20	1
RC9006	BIW2T6-90V3		-20	1
RC9007	BIW3T1-55		-	1
RC9008			-10	1
RC9009			-20	1
RC9010			-40	1
RC9011	BIW3T1-90V3		-20	1
RC9012	BIW3		-	1
RC9013	BI		-	1
RC9014	BIT6-90V3		0	1
RC9015			-20	1
RC9016			-40	1
RC9031	BI5W3T6-90V3		-20	1
RC9032	BI4W3T6-90V3		-20	1
RC9033	BIW3T6-90V3		0	1
RC9034			+20	1
RC9035	BIT6-90V3		+20	1

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CLM	CN	CYN	CY	CBL	CA	CAB	CL	CD	L/D
1	2	3	4	5	6	7	8	9	10

COEFFICIENTS:

n or B  
SCHEDULES

$$\Delta A = 0 \text{ to } .56 \text{ DEGAUSS}$$

386

DELTA WING BOOSTER  
GD/C  
DR#1029 A-1-293



TEST GDHWT 247-0 DATA SET COLLATION SHEET

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**COEFFICIENTS:**

 $\alpha_A = 0$  to 56 DEGREES

387

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# TEST GDHWT 247-0 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS															
		$\alpha$	$\beta$	$\delta_{1e}$	$\delta_{2e}$				8.05															
RC9017	B <sub>7</sub> W <sub>5</sub> V <sub>3</sub>	A	0	15	15			1	17															
RC9019				0	0			1	19															
RC9020				-10	-10			1	20															
RC9021				-40	-40			1	21															
RC9022				-60	-60			1	22															
RC9023				-20	-20			1	23															
RC9024	↓			0	-20			1	24															
RC9025	B <sub>7</sub> V <sub>3</sub>			-	-			1	25															
RC9026	B <sub>7</sub>			-	-			1	26															
RC9027	B <sub>7</sub> W <sub>5</sub> V <sub>3</sub>			0	0			1	27															
RC9028	B <sub>7</sub> W <sub>5</sub> V <sub>3</sub> E <sub>7</sub>			0	0			1	28															
RC9029	B <sub>7</sub> W <sub>5</sub> V <sub>3</sub>			-10	-10			1	29															
RC9030	B <sub>7</sub> W <sub>5</sub> V <sub>3</sub>	↓	↓	-20	-20			1	30															

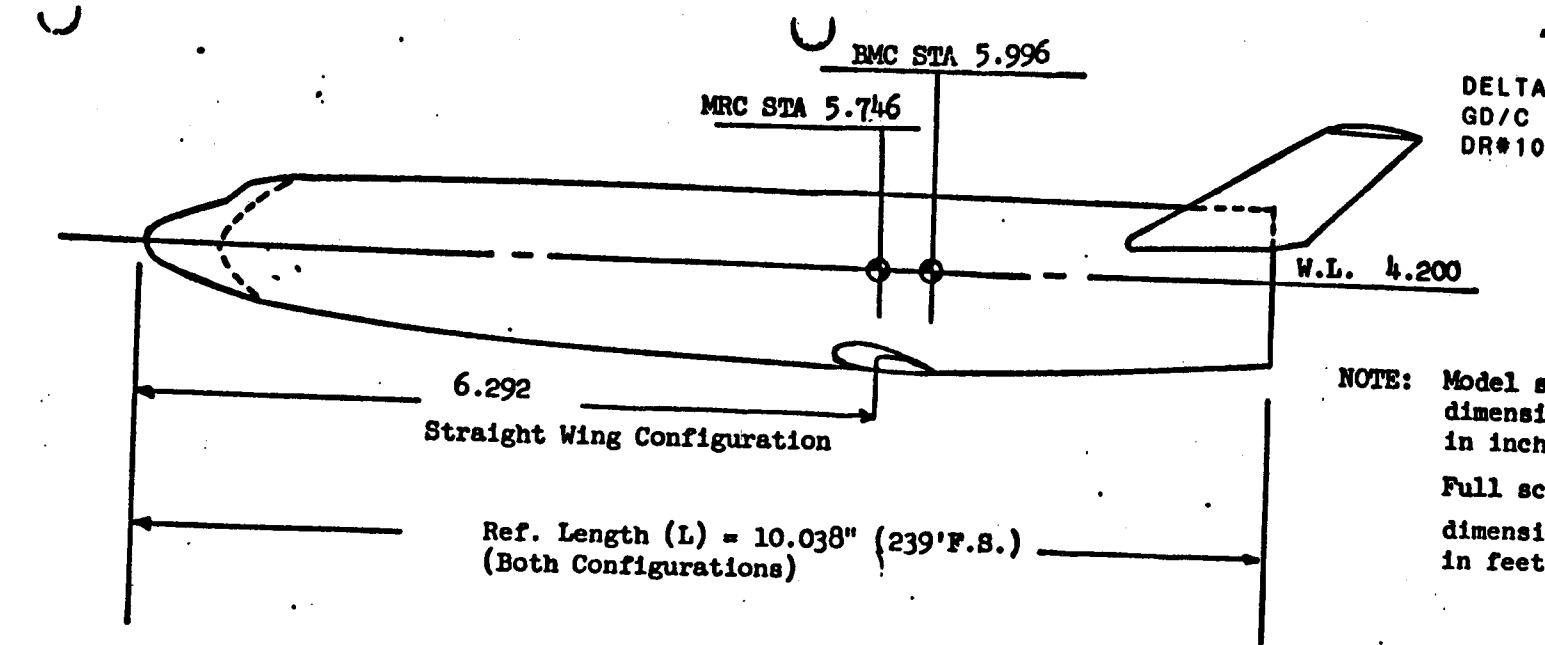
1 7 13 19 25 31 37 43 49 55 61 67 75 76  
 CLM CN CYN CY CBL CA CAB CL CD L/D 10

COEFFICIENTS:

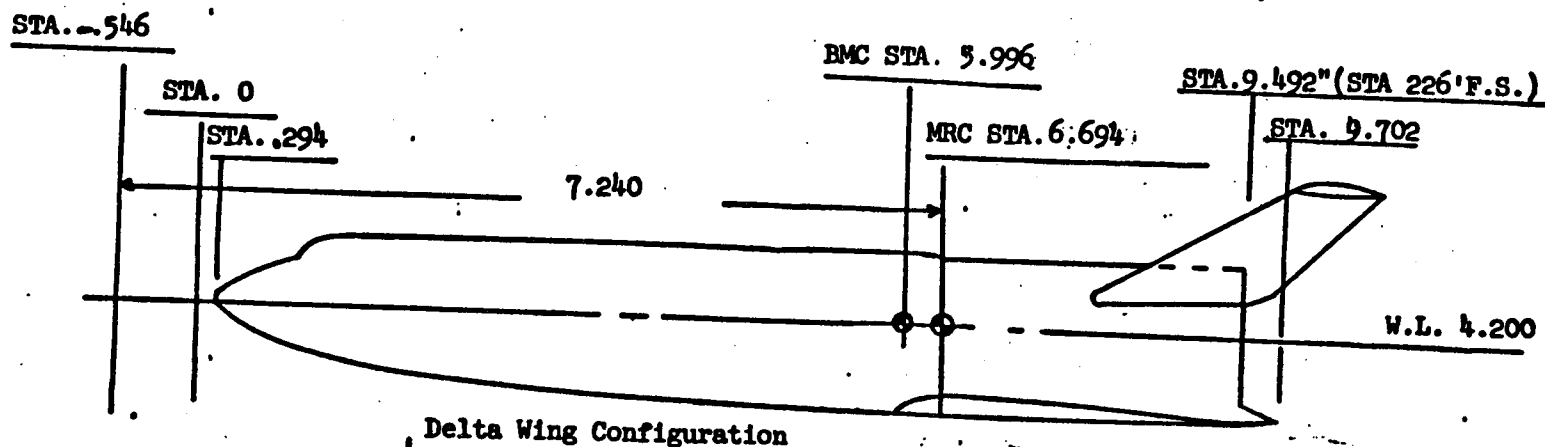
" OF  $\beta$   
 SCHEDULES

$\alpha = 0$  to 56 DEGREES

DELTA WING BOOSTER  
 GD/C  
 DR#1029 A-1- 295



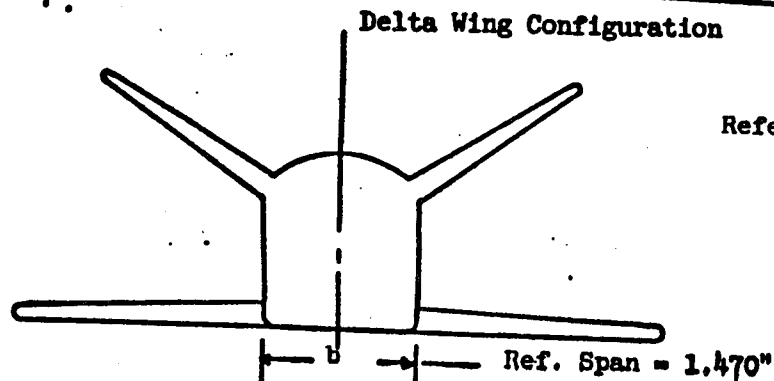
NOTE: Model scale dimensions are in inches.  
Full scale dimensions are in feet.



Reference Area (S) = 12.679 sq. in.

Figure 1.

Moment Transfer Diagram and Reference Lengths.



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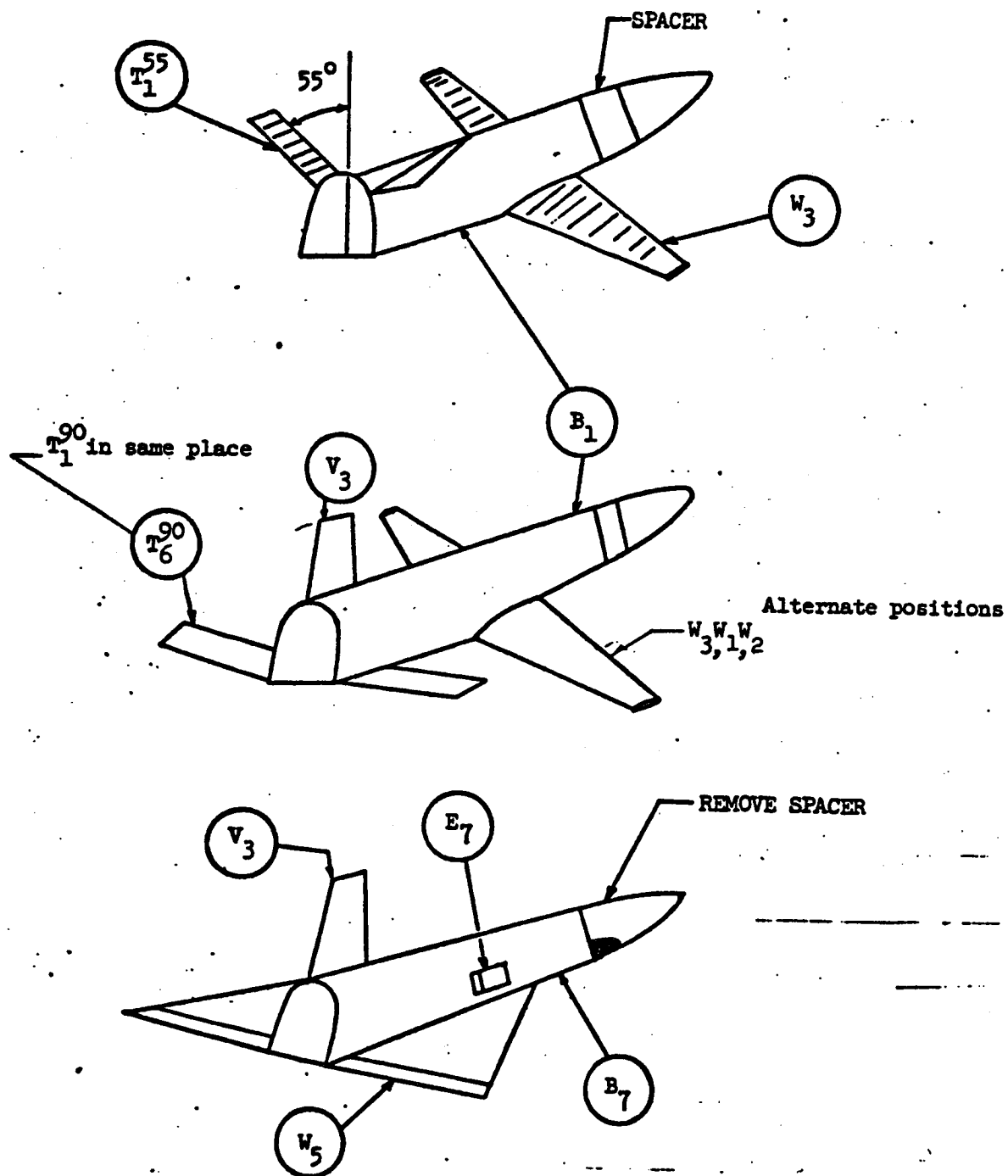


Figure 2. Isometric Views of Complete Configurations Tested.

TEST CV 45WT 579-0 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCUD.	CONTROL DEFLECTION	NO. OF RUNS	MACH NUMBERS
RC7001	B.W. <sup>15</sup> T. <sup>55</sup>	A 0	0 0	3	5
RC7002		B -8	0 0	1	7
RC7003		B -4	0 0	1	9
RC7004	B.W. <sup>15</sup> T. <sup>55</sup> F. <sup>35</sup> G.	A 0	0 0	1	8
RC7005	B.W. <sup>15</sup> T. <sup>55</sup> F. <sup>35</sup> G.	A 0	0 0	1	10
RC7006		B -4	0 0	1	12
RC7007	B.W. <sup>15</sup> T. <sup>55</sup> S. <sup>30</sup> G.	A 0	0 0	1	13
RC7008	B.W. <sup>15</sup> T. <sup>55</sup> S. <sup>30</sup> G.	A 0	0 0	1	14
RC7009		B -4	0 0	1	15
RC7010	B.W. <sup>15</sup> T. <sup>55</sup> F. <sup>35</sup> G.	A 0	0 0	1	16
RC7011	B.W. <sup>15</sup> T. <sup>55</sup> F. <sup>35</sup> G.	A 0	0 0	1	17
RC7012		B -8	0 0	1	18
RC7013		B -4	0 0	1	20
RC7014		A 0	-10 0	1	21
RC7015		A 0	0 +10	1	22
RC7016		B -8	0 +10	1	23
RC7017		B -4	0 +10	1	24
RC7018		A 0	0 -20	1	25
RC7019		A 0	0 +20	1	26
RC7020		B -8	0 +20	1	27
				1	28

CLM	ICM	ICLN	ICY	ICSL	ICA	ICB	ICL	ICD	L/D	MACH	ALPHA	NOV
1	7	13	19	25	31	37	43	49	55	61	67	7576
COEFFICIENTS:												
" OF R												
SCHEDULES												
Aα = - 6 TO +18 DEG Δα = 2 DEG												
Bα = 0 TO +16 DEG Δα = 4 DEG												
Cα = 0 TO +24 DEG Δα = 4 DEG												
IDPVAR(1) IDPVAR(2) NOV												

# TEST CV LSMT 579-0 DATA-SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS									
		$\alpha$	$\beta$	$\delta_{er}$	$\delta_{rr}$				.184	.225	.259	.318						
RC7021	B, W, <sup>15</sup> T, <sup>55</sup> F, <sup>45</sup> G,	B	-4	0	+20			1	29									
RC7022		A	0	-30	0			1	30									
RC7023		A	0	+10	0			1	31									
RC7024	B, W, <sup>15</sup> T, <sup>55</sup>	A	0	+10	0			1			32							
RC7025		A	0	-10	0			1			33							
RC7026		A	0	0	+10			1			34							
RC7027		B	-8	0	+10			1			35							
RC7028		B	-4	0	+10			1			36							
RC7029		A	0	-20	0			1			37							
RC7030		A	0	0	+20			1			38							
RC7031		B	-8	0	+20			1			39							
RC7032		B	-4	0	+20			1			40							
RC7033		A	0	-30	0			1			41							
RC7034	B, W, <sup>15</sup> T, <sup>55</sup> F, <sup>45</sup>	A	0	0	0			1	42									
RC7035		B	-4	0	0			1	43									
RC7036	B, W, <sup>15</sup> T, <sup>55</sup> F, <sup>45</sup> E,	A	0	0	0			1	44									
RC7037		B	-4	0	0			1	45									
RC7038	B, W, <sup>15</sup> T, <sup>55</sup> E,	A	0	0	0			1			46							
RC7039		B	-4	0	0			1			47							
RC7040	B, W, <sup>15</sup>	A	0					1			48							

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
 CLM ICN ICN ICY CSL CA CAB ICL CD IL/D MACH ALPHA 10

COEFFICIENTS:

$\alpha$  or  $\beta$

SCHEDULES

$A\alpha = -6$  TO  $+18$  DEG  $\Delta\alpha = 2$  DEG

$B\alpha = 0$  TO  $+16$  DEG  $\Delta\alpha = 4$  DEG

$C\alpha = 0$  TO  $+24$  DEG  $\Delta\alpha = 4$  DEG

→ IDPVAR(1) IDPVAR(2) NDV

DELTA WING BOOSTER

GD/C

DR#1030 A-1- 299

TEST CV LSWT 679-0 DATA SET COLLATION SHEET

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☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. OF RUNS	MACH NUMBERS															
		u	P	$\delta_{ep}$	$\delta_{er}$		$\delta_a$		.184	.225	.259	.318												
RC7041	B, W, <sup>15</sup>	B	-8					1																
RC7042	↓	B	-4					1																
RC7043	B, W, <sup>15</sup> F, <sup>15</sup>	A	0					1	51															
RC7044	↓	B	-4					1	52															
RC7045	B, W, <sup>15</sup> T, <sup>15</sup>	A	0	0	0			1																
RC7046	↓	B	-4	0	0			1																
RC7047	B, W, <sup>15</sup> T, <sup>35</sup>	A	0	0	0			1																
RC7048	↓	B	-4	0	0			1																
RC7049	B, W, <sup>15</sup> T, <sup>10</sup> V, <sup>1</sup>	A	0	0		0		1																
RC7050	↓	B	-4			0		1																
RC7051	↓	A	0			0		1																
RC7052	↓	A	0			0		1																
RC7053	B, W, <sup>15</sup> T, <sup>10</sup> V, <sup>1</sup> F, <sup>15</sup>	A	0	10		0		1	61															
RC7054	↓	A	0	10		0		1	62															
RC7055	↓	A	0	0		0		1	63															
RC7056	↓	B	-4	0		0		1	64															
RC7057	B, W, <sup>15</sup> T, <sup>10</sup>	A	0	0				1																
RC7058	↓	B	-4	0				1																
RC7059	B, W, <sup>15</sup> E, <sup>1</sup>	A	0																					
RC7060	B, W, <sup>15</sup> E, <sup>1</sup>	A	0																					

1	7	11	14	24	31	37	41	44	51	61	67	75%
C.L.M.	K.N.	ICLN	CY	CSL	CA	FAB	ICL	CD	L/D	MACH	ALPHA	10
COEFFICIENTS:												
u or P												
SCHEDULES												
A $\alpha$ = -6 TO +18 DEG						A $\alpha$ = 2 DEG						
B $\alpha$ = 0 TO +16 DEG						A $\alpha$ = 4 DEG						
C $\alpha$ = 0 TO +24 DEG						A $\alpha$ = 4 DEG						

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# TEST CV LSWT 579-0 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS									
		$\alpha$	$\beta$	$\delta_{cr}$	$\delta_{rr}$				.184	.225	.259	.318						
RC7061	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0	0	0			1			69							
RC7062	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0	0	0			1			70							
RC7063	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0	0	0			1			71							
RC7064	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0	0	0			1			72							
RC7065	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0					1			73							
RC7066	↓	A	0					1			74							
RC7067	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0	0	0			1			75							
RC7068	↓	A	0	0	0			1			76							
RC7069	↓	B	-4	0	0			1			77							
RC7070	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0	0	0			1			78							
RC7071	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0	0	0			1			79							
RC7072	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0					1			80							
RC7073	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0					1			81							
RC7074	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0					1			82							
RC7075	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0					1			83							
RC7076	B, W, <sup>ss</sup> T, <sup>ss</sup> E <sub>2</sub>	A	0					1			84							
RC7077	B, T, <sup>ss</sup> E <sub>2</sub>	A	0	0	0			1			85							
RC7078	↓	B	-4	0	0			1			86							
RC7079	B, T, <sup>ss</sup> E <sub>2</sub>	A	0					1			87							
RC7080	↓	B	-4					1			88							

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CLM	CLN	CLN	CY	CSE	CA	CAB	CL	CD	L/D	MACH	ALPHA	10	

COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

$A\alpha = -6$  TO  $+18$  DEG  $\Delta\alpha = 2$  DEG

$B\alpha = 0$  TO  $+16$  DEG  $\Delta\alpha = 4$  DEG

$C\alpha = 0$  TO  $+24$  DEG  $\Delta\alpha = 4$  DEG

IDPVAR(1) IDPVAR(2) NDV

DELTA WING BOOSTER  
GD/C  
DR#1030 A-1- 301



☒ POSTTEST

TEST CV 15W1 579-0 DATA SET COLLATION SHEET

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" or " 10 11

**COMMENTS:**

# TEST CV LSWT 579-0 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS									
		$\alpha$	$\beta$	$\delta_{ee}$	$\delta_{ae}$	$\delta_r$		.184	.225	.259	.318						
RC7101	B <sub>7</sub> W <sub>5</sub> V <sub>1</sub> E <sub>2</sub> G <sub>2</sub>	B	-4	0	0	0	1			109							
RC7102	B <sub>7</sub> W <sub>5</sub> V <sub>1</sub> E <sub>2</sub>	C	0	0	0	0	1			110							
RC7103	↓	B	-4	0	0	0	1			111							
RC7104	B <sub>7</sub> W <sub>5</sub> V <sub>1</sub> E <sub>2</sub>	C	0	0	0	0	1			112							
RC7105	↓	B	-4	0	0	0	1			113							
RC7106	B <sub>7</sub> W <sub>5</sub> V <sub>1</sub> E <sub>2</sub>	C	0	0	0	0	1			114							
RC7107	↓	B	-4	0	0	0	1			115							
RC7108	B <sub>7</sub> W <sub>5</sub>	B	-4	0	0		1			116							
RC7109	↓	C	0	0	0		1			117							
RC7110	B <sub>7</sub> W <sub>5</sub> V <sub>1</sub>	C	0	0	0	0	1			118							
RC7111	↓	B	-8	0	0	0	1			119							
RC7112	↓	B	-4	0	0	0	1			120							
RC7113	B <sub>7</sub>	A	0				1			121							
RC7114	↓	B	-8				1			122							
RC7115	↓	B	-4				1			123							

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CLM	ICN	ICLN	ICY	ICSL	CA	CAB	CL	CD	L/D	MACH	ALPHA	10	

COEFFICIENTS:

$\alpha$  or  $\beta$

SCHEDULES

$A\alpha = -6$  TO  $+18$  DEG  $\Delta\alpha = 2$  DEG

$B\alpha = 0$  TO  $+16$  DEG  $\Delta\alpha = 4$  DEG

$C\alpha = 0$  TO  $+24$  DEG  $\Delta\alpha = 4$  DEG

→ IDPVAR(1) IDPVAR(2) NDV

DELTA WING BOOSTER

GD/C

DR#1030

A-1- 303

TEST CV LSWT 579-0 DATA SET COLLATION SHEET

DELTA WING BOOSTER  
GD/C  
DR#1030 A-1- 304

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. OF RUNS	MACH NUMBERS									
		u	P	$\delta_{cr}$	$\delta_{aa}$	$\delta_n$		.184	.225	.259	.318						
RC7116	B, W <sub>3A</sub> T <sub>1</sub> <sup>SS</sup>	A	0	0	0		1										
RC7117	↓	B	-4	0	0		1			124							
RC7118	B, W <sub>3A</sub> T <sub>2</sub> <sup>SS</sup>	A	0	0	0		1			125							
RC7119	↓	B	-4	0	0		1			126							
RC7120	B, W <sub>3A</sub>	A	0				1			127							
RC7121	↓	B	-4				1			128							
RC7122	B <sub>0</sub> W <sub>3A</sub> T <sub>1</sub> <sup>SS</sup>	A	0	0	0		1			129							
RC7123	↓	B	-4	0	0		1			130							
RC7124	B <sub>5</sub> W <sub>3A</sub> T <sub>1</sub> <sup>SS</sup>	A	0	0	0		1			131							
RC7125	↓	B	-4	0	0		1			132							
RC7126	B <sub>5</sub> W <sub>3A</sub>	A	0				1			133							
RC7127	↓	B	-4				1			134							
RC7128	B <sub>0</sub> W <sub>3A</sub>	A	0				1			135							
RC7129	↓	B	-4				1			136							
RC7130	B <sub>0</sub> W <sub>3A</sub> T <sub>1</sub> <sup>SS</sup>	A	0	0	0		1			137							
RC7131	↓	B	-4	0	0		1			138							
RC7132	B, W <sub>3A</sub> T <sub>1</sub> <sup>SS</sup>	A	0	-10	0		1			139							
RC7133	B, W <sub>3A</sub> T <sub>1</sub> <sup>SS</sup> F <sub>1</sub> <sup>35</sup>	A	0	-10	0		1	141									
RC7134	B, W <sub>3A</sub> T <sub>1</sub> <sup>SS</sup> V <sub>1</sub> <sup>35</sup>	A	0	1		0	1	142									

1	7	11	19	25	31	37	43	49	55	61	67	75.7
CLM	ICN	ICLN	ICY	ICSL	ICA	ICAB	ICL	ICD	L/D	MACH	ALPHA	10
COEFFICIENTS:												
u OF P												
SCHEDULES												
A $\alpha$ = -6 TO +18 DEG						$\Delta\alpha$ = 2 DEG						
B $\alpha$ = 0 TO +16 DEG						$\Delta\alpha$ = 4 DEG						
C $\alpha$ = 0 TO +14 DEG						$\Delta\alpha$ = 1 DEG						

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DELTA WING BOOSTER  
GD/C  
DR#1030 A-1- 306

CONFIGURATION  $B, W, V, E_L$

NOTE: ALL DIMENSIONS, STATIONS,  
BUTT LINES AND WATER LINES  
ARE MODEL SCALE IN INCHES

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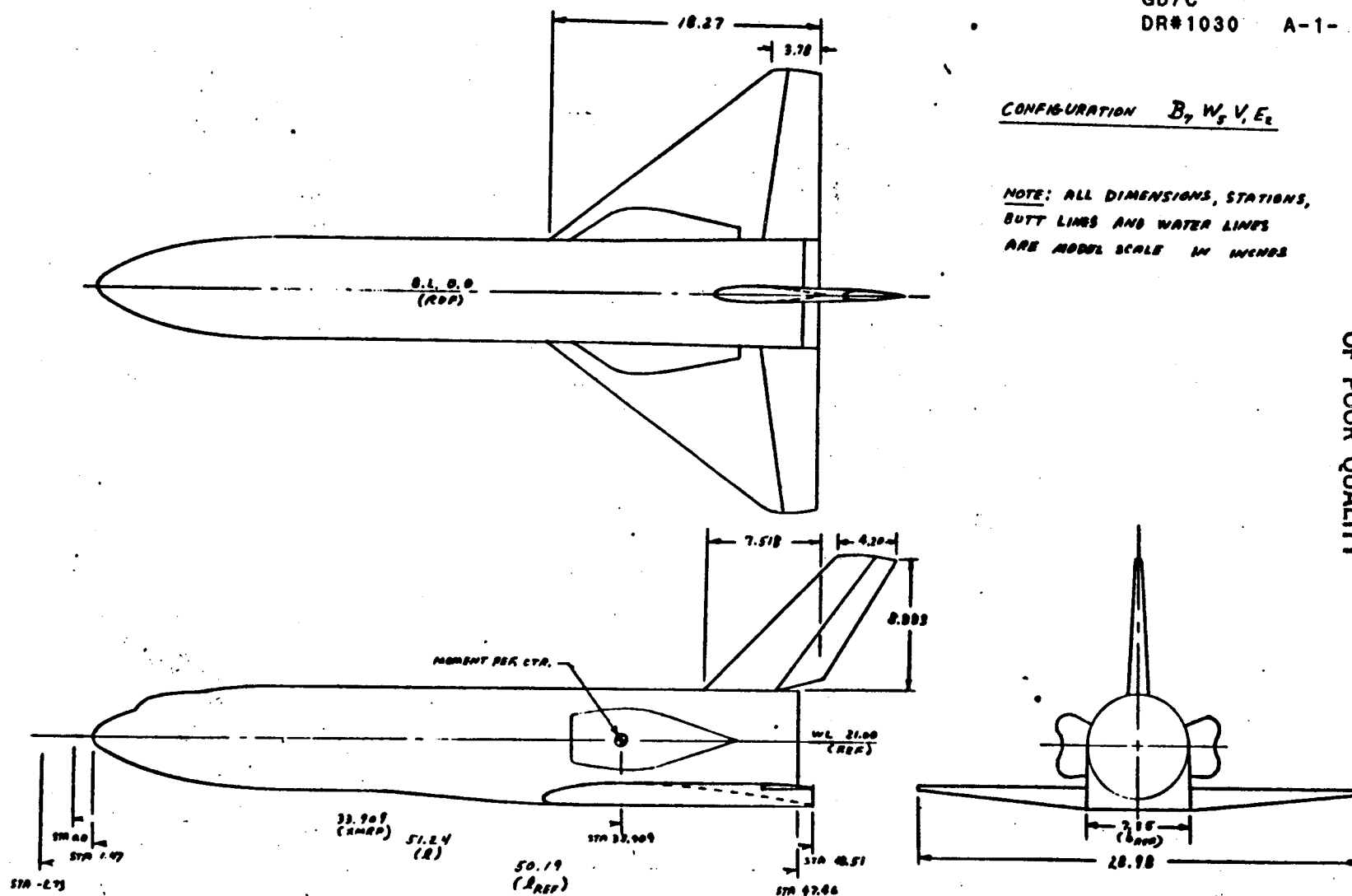


Figure 3. GD/Convair Delta Wing Space Shuttle Booster.

# TEST CV LSWT 580-0 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS															
		A	B	$\delta_{er}$	$\delta_r$				.184	.257														
RCB001	B <sub>7</sub> W <sub>3A</sub>	A	0	-	-			1		1														
RCB002	B <sub>9</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub>	A	0	0	0			1		2														
RCB003	B <sub>9</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>10</sub>	A	0	0	0			1		3														
RCB004	↓	D	-4	0	0			1		4														
RCB005	B <sub>9</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>10</sub>	A	0	0	0			1		5														
RCB006	B <sub>9</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>11</sub>	A	0	0	0			1		6														
RCB007	↓	D	-4	0	0			1		7														
RCB008	B <sub>9</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>12</sub>	A	0	0	0			1		8														
RCB009	↓	D	-4	0	0			1		9														
RCB010	B <sub>9</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>9</sub>	A	0	0	0			1		10														
RCB011	B <sub>9</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>13</sub>	A	0	0	0			1		11														
RCB012	B <sub>10</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>17</sub>	A	0	0	0			1		12														
RCB013	B <sub>10</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>15</sub>	A	0	0	0			1		13														
RCB014	B <sub>10</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>24</sub>	A	0	0	0			1		14														
RCB015	B <sub>10</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>25</sub>	A	0	0	0			1		15														
RCB016	B <sub>10</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>16</sub>	A	0	0	0			1		16														
RCB017	B <sub>10</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>17</sub>	A	0	0	0			1		17														
RCB018	↓	D	-4	0	0			1		18														
RCB019	B <sub>12</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>10</sub>	A	0	0	0			1		19														
RCB020	B <sub>9</sub> W <sub>3A</sub> T <sub>2</sub> V <sub>2</sub> E <sub>26</sub>	A	0	0	0			1		20														

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CLM	ICN	ICLN	ICY	ICSL	ICA	CAB	ICL	CD	L/D	MACH	ALPHA	1.0	
COEFFICIENTS:													
u or B													
SCHEDULES													
A $\alpha$ = -6 TO +18 DEG $\Delta\alpha$ = 2 DEG													→ IDPVAR(1) IDPVAR(2) NDV
D $\alpha$ = -6 TO +12 DEG $\Delta\alpha$ = 2 DEG													

DELTA WING BOOSTER  
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☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS															
		u	P	$\delta_{ex}$	$\delta_r$				.184	.259														
RC8021	B <sub>9</sub> W <sub>1A</sub> T <sub>9</sub> V <sub>9</sub> E <sub>26</sub>	D	-4	0	0			1		21														
RC8022	B <sub>9</sub> W <sub>2A</sub> T <sub>9</sub> V <sub>9</sub> E <sub>26</sub>	A	0	0	0			1		22														
RC8023	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> K <sub>2</sub> E <sub>26</sub>	A	0	0	0			1		23														
RC8024	↓	D	-4	0	0			1		24														
RC8025	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> K <sub>2</sub> E <sub>19</sub>	A	0	0	0			1		25														
RC8026	↓	D	-4	0	0			1		26														
RC8027	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> K <sub>2</sub> E <sub>20</sub>	A	0	0	0			1		27														
RC8028	↓	D	-4	0	0			1		28														
RC8029	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> K <sub>2</sub> E <sub>18</sub>	A	0	0	0			1		29														
RC8030	↓	D	-4	0	0			1		30														
RC8031	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> K <sub>2</sub>	A	0	0	0			1		31														
RC8032	↓	D	-4	0	0			1		32														
RC8033	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> E <sub>27</sub>	A	0	0	0			1		33														
RC8034	↓	D	-4	0	0			1		34														
RC8035	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> E <sub>26</sub>	A	0	-10	0			1		35														
RC8036	↓	A	0	-20	0			1		36														
RC8037	↓	A	0	-30	0			1		37														
RC8038	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> F <sub>1</sub> <sup>46</sup> E <sub>26</sub>	A	0	-30	0			1	38															
RC8039	B <sub>9</sub> W <sub>3A</sub> T <sub>9</sub> V <sub>9</sub> E <sub>28</sub>	A	0	0	0			1		39														
RC8040	↓	D	-4	0	0			1		40														

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CLM	ICN	CLN	CY	CSL	CA	CAB	CL	CD	L/D	MACH	ALPHA	10	

COEFFICIENTS:

α or β

SCHEDULES

$\Delta\alpha = -6$  TO  $+18$  DEG;  $\Delta\alpha = 2$  DEG

$\Delta\alpha = -6$  TO  $+12$  DEG;  $\Delta\alpha = 2$  DEG

→ IDPVAR(1) IDPVAR(2) NDV

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# TEST CV 15WT 580-0 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION	NO. of RUNS	MACH NUMBERS
RCB041	$B_1 W_{10} T_0 V_1 F^{10} E_{10}$	A 0	-30 0	1	41
RCB042	$B_1 W_{10} T_0 V_1 E_{10}$	A 0	-10 0	1	42
RCB043		A 0	10 0	1	43
RCB044		D -4	10 0	1	44
RCB045	$B_1 W_{10} T_0 V_1$	A 0	-30 0	1	45
RCB046		A 0	-10 0	1	46
RCB047	$B_1 W_{10} E_{10}$	A 0	-	1	47
RCB048	$B_1 W_{10} E_{10}$	A 0	-	1	48
RCB049	$B_1 E_{10}$	A 0	-	1	49
RCB050	$B_1$	A 0	-	1	50
RCB051	$B_1 E_{10}$	A 0	-	1	51
RCB052	$B_1 T_0 V_1 E_{10}$	A 0	0 0	1	52
RCB053	$B_1 T_0 V_1 E_{10}$	A 0	0 0	1	53
RCB054	$B_1 T_0 V_1$	A 0	0 0	1	54
RCB055	$B_1 W_{10} T_0 V_1 E_{10}$	A 0	0 0	1	55
RCB056		D -4	0 0	1	56
RCB057		A 0	-30 0	1	57
RCB058	$B_1 W_{10} T_0 V_1 F^{10} E_{10}$	A 0	-30 0	1	58
RCB059	$B_1 W_{10} T_0 V_1 F^{10} E_{10}$	A 0	-30 0	1	59
RCB060	$B_1 W_{10} T_0 V_1 K_1 E_{10}$	A 0	-30 0	1	60

CLM	ICN	ICLN	CY	CSL	CA	CA8	ICL	CD	L/D	MACH	ALPHA	IO
7	13	19	25	31	37	43	49	55	61	67	7576	
IDPVAR(1) IDPVAR(2) NDV												

COEFFICIENTS:  
 a or B  
 SCHEDULES

$\Delta\alpha = -6.50 + 18 \text{ DEG}; \Delta\alpha = 2 \text{ DEG}$   
 $\Delta\alpha = -6.70 + 12 \text{ DEG}; \Delta\alpha = 2 \text{ DEG}$

DELTA WING BOOSTER  
 GD/C  
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TEST CV 13WT 380-0 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION	NO. OF RUNS	MACH NUMBERS																						
RCB061	B <sub>1</sub> W <sub>1</sub> T <sub>1</sub> V <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	-10	0	1	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
RCB062		A	0	0	0	1																					
RCB063		D	-4	0	0	1																					
RCB064	B <sub>1</sub> W <sub>1</sub> T <sub>1</sub> V <sub>1</sub>	D	-4	0	0	1																					
RCB065	B <sub>1</sub> W <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	-	-	1																					
RCB066	B <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	-	-	1																					
RCB067	B <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	-	-	1																					
RCB068	B <sub>1</sub> T <sub>1</sub> V <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB069	B <sub>1</sub> T <sub>1</sub> V <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB070	B <sub>1</sub> W <sub>1</sub> T <sub>1</sub> V <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB071		D	-4	0	0	1																					
RCB072		A	0	-10	0	1																					
RCB073		A	0	10	0	1																					
RCB074	B <sub>1</sub> W <sub>1</sub> T <sub>1</sub> V <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB075	B <sub>1</sub> W <sub>1</sub> T <sub>1</sub> V <sub>1</sub> F <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB076	B <sub>1</sub> W <sub>1</sub> T <sub>1</sub> V <sub>1</sub> F <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB077	B <sub>1</sub> W <sub>1</sub> T <sub>1</sub> V <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB078	B <sub>1</sub> T <sub>1</sub> V <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB079	B <sub>1</sub> T <sub>1</sub> V <sub>1</sub> K <sub>1</sub> E <sub>1</sub>	A	0	0	0	1																					
RCB080	B <sub>1</sub> T <sub>1</sub> V <sub>1</sub>	A	0	0	0	1																					

CLM	ICN	ICLN	ICY	ICSL	CA	CAB	CL	CD	L/D	MACH	ALPHA	IC	
1	7	13	19	25	31	37	43	49	55	61	67	75	76

COEFFICIENTS:

u or B  
SCHEDULES

Ad = -6 To +18 DEG Ad = 2 DEG  
DA = -6 To +12 DEG DA = 2 DEG

IDPVAR(1)|IDPVAR(2)|NDV

TEST CV LSWT 580-0 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION	NO. of RUNS	MACH NUMBERS
RCB081	$B_1 T_2 V_2$	D -4	0	1	81
RCB082	$B_1 W_2 T_2 V_2 K_2 E_2$	A 0	0	1	82
RCB083		D -4	0	1	83
RCB084		A 0	-10	1	84
RCB085	$B_1 W_2 T_2 V_2 F_2 K_2 E_2$	A 0	0	1	85
RCB086	$B_1 W_2 T_2 V_2 F_2 E_2$	A 0	0	1	86
RCB087	$B_1 W_2 T_2 V_2 E_2$	A 0	0	1	87
RCB088		D -4	0	1	88
RCB089		A 0	-10	1	89
RCB090	$B_1 W_2 T_2 V_2 E_2$	A 0	0	1	90
RCB091		D -4	0	1	91
RCB092	$B_1 W_2 T_2 V_2$	A 0	0	1	92
RCB093		D -4	0	1	93
RCB094		A 0	10	1	94
RCB095		A 0	-10	1	95
RCB096	$B_1 W_2 T_2 V_2 E_2$	A 0	-10	1	96
RCB097		D -4	-10	1	97
RCB098		A 0	0	1	98
RCB099		D -4	0	1	99
RCB100	$B_1 T_2 V_2 E_2$	A 0	0	1	100

CLM	CLN	CLN	CY	CYL	CA	CAB	CL	CD	L/D	MACH	ALPHA	IO
7	13	19	25	31	37	43	49	55	61	67	75	76

COEFFICIENTS:

a or b

SCHEDULES

$A_2 = -6 T_0 + 18 DEC$ ;  $A_2 = 2 DEC$

$D_2 = -6 T_0 + 12 DEC$ ;  $A_2 = 2 DEC$

IDPVAR(1) IDPVAR(2) NDV

DELTA WING BOOSTER  
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DELTA WING BOOSTER  
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TEST CV LSWT 580-0 DAT. SET COLLATION SHEET

**☐ PRETEST**

## ☒ POSTTEST

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1	7	13	19	25	31	37	43	49	55	61	67	75	76
CLM	FN	ICLN	EY	ICSL	CA	CAB	ICL	CD	L/D	MACH	ALPHA	10	
COEFFICIENTS:													
a or b $\Delta d = -6 \text{ TO } +18 \text{ DEG}; \Delta d = 2 \text{ DEG}$ $\Rightarrow$ IDPVAR(1) IDPVAR(2) NDV													
SCHEDULES $\Delta d = -6 \text{ TO } +12 \text{ DEG}; \Delta d = 2 \text{ DEG}$													

## ☒ POSTTEST

CONFIGURATION B, W, T & E.

NOTE.  
ALL DIMENSIONS, STATIONS,  
WATER LINES AND DIRT LINES  
ARE MODEL SCALE IN INCHES

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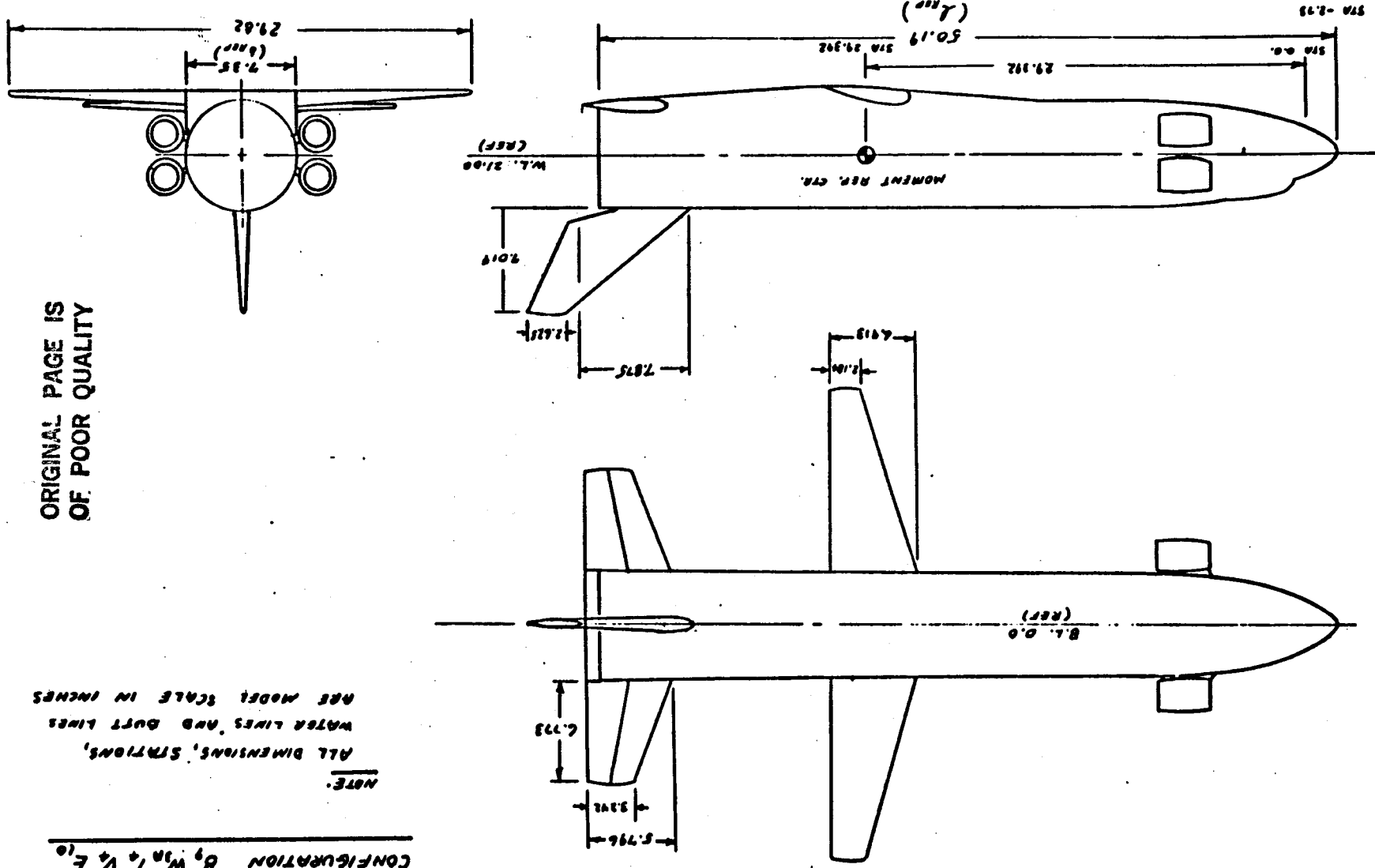
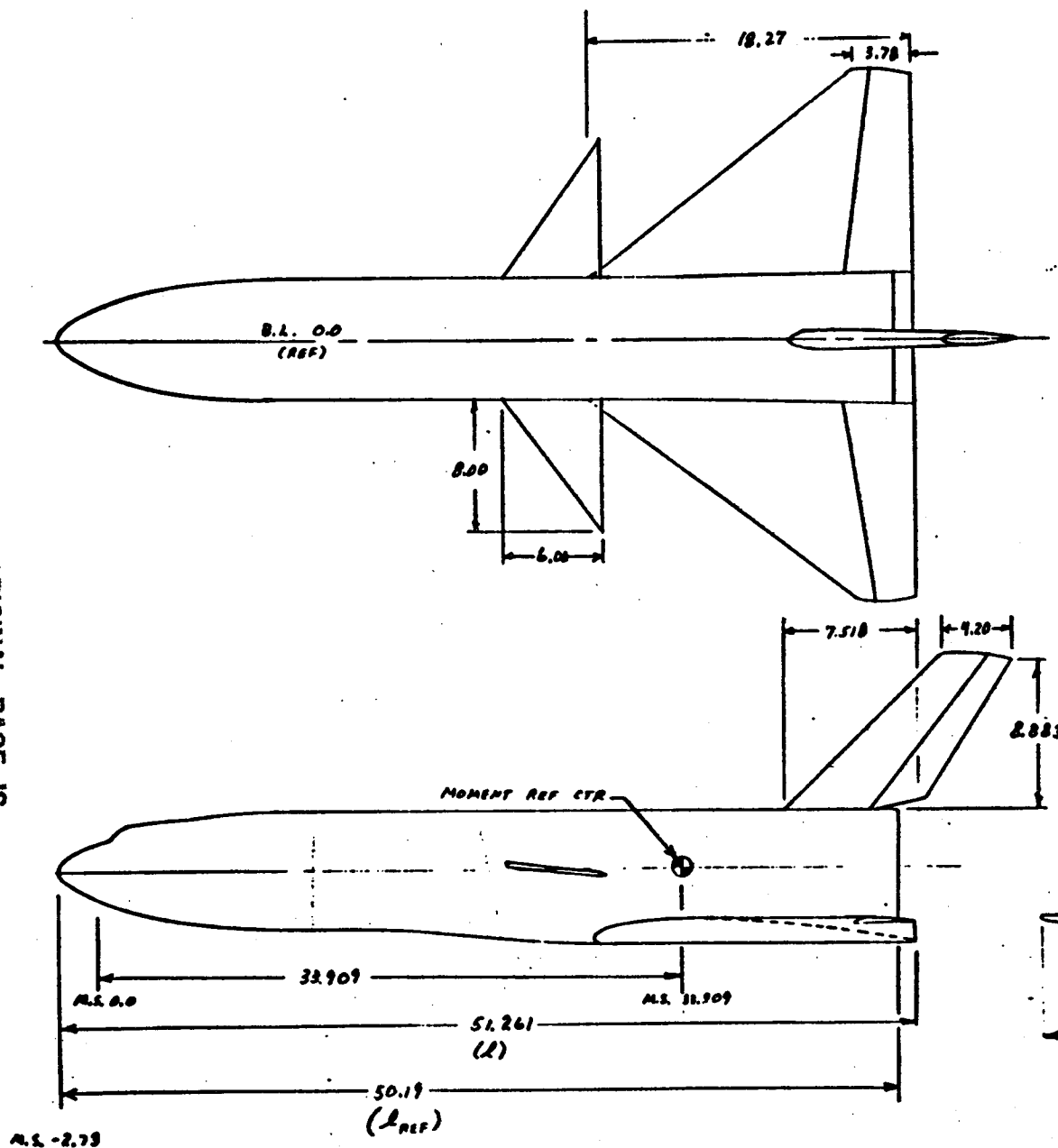


Figure 2. OD/Convair Straight Wing Space Shuttle Booster.

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CONFIGURATION  $B, W, V, C_{2A}$

NOTE:

ALL DIMENSIONS, STATIONS,  
WATER LINES AND BUTT LINES  
ARE MODEL SCALE IN INCHES.

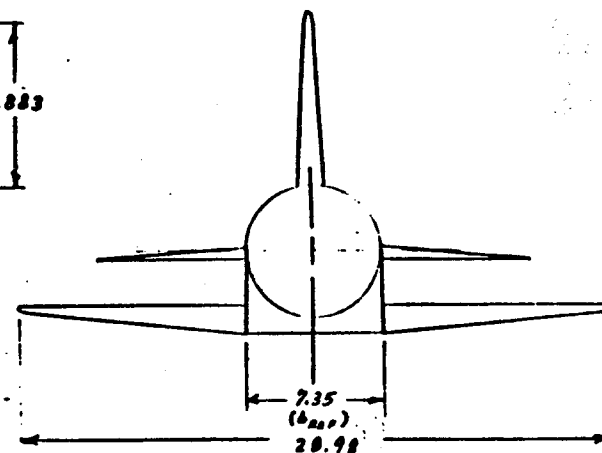


Figure 3. GD/Convair Delta Wing Space Shuttle Booster.

NOTES:

1. ALL DIMENSIONS, MODEL STATIONS  
AND BUTT LINES IN INCHES
2. HINGE LINE AT 50 PERCENT CHORD

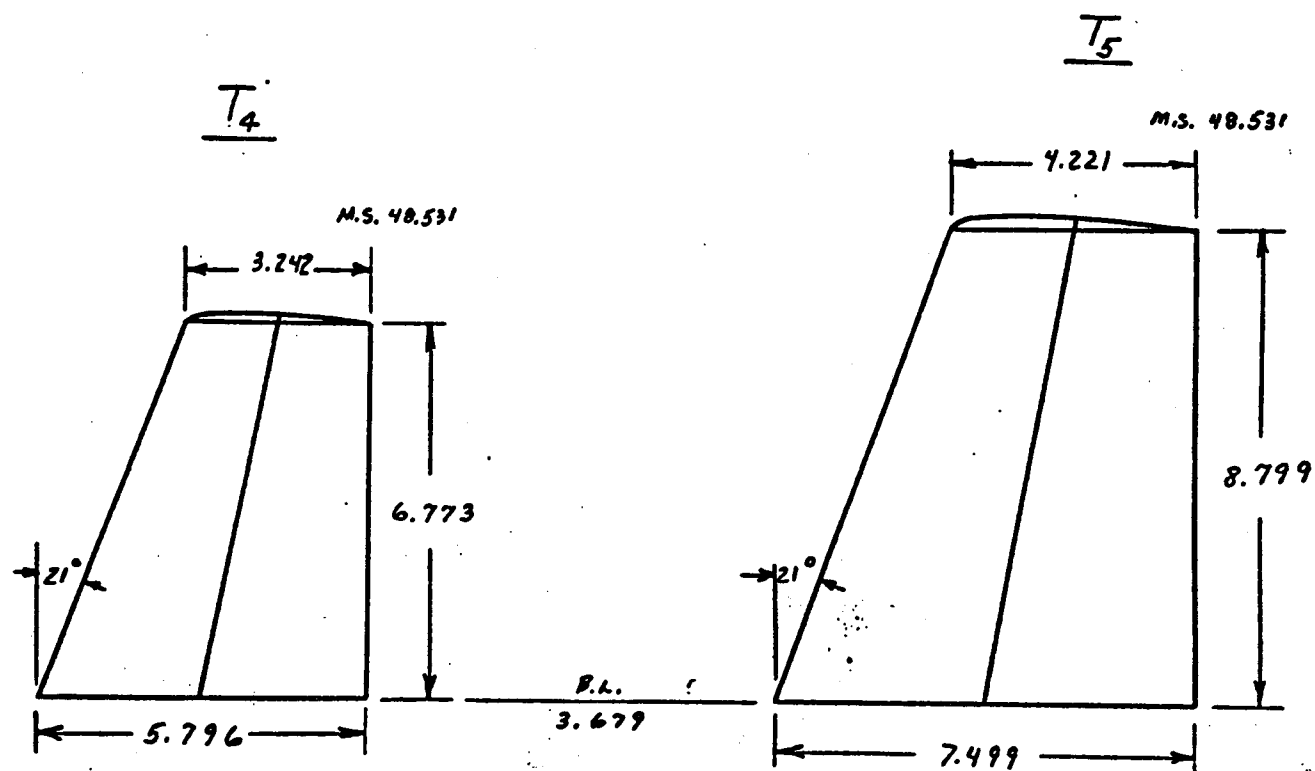


Figure 4. Horizontal Tail Geometry

NOTE 1

ALL DIMENSIONS AND  
MODEL STATIONS IN INCHES

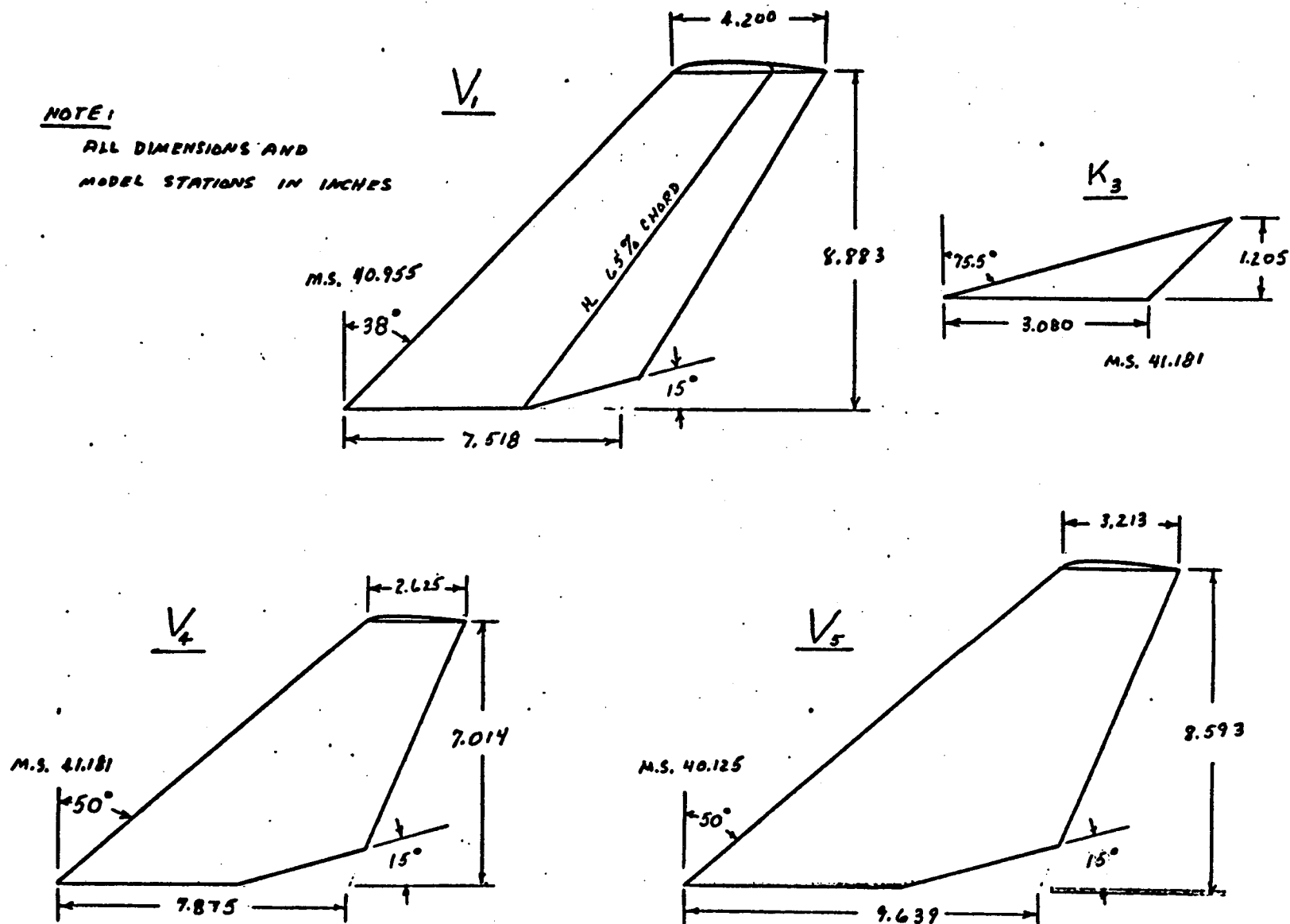
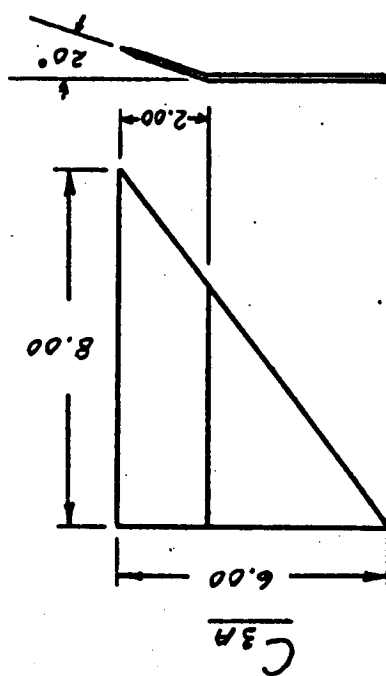
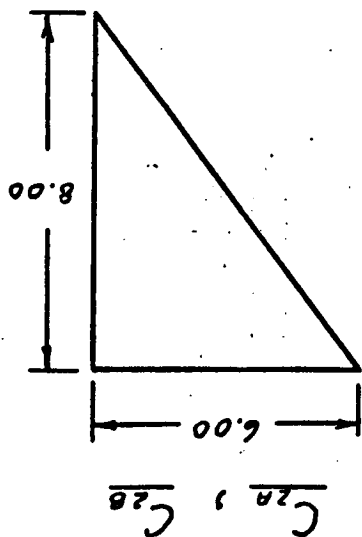
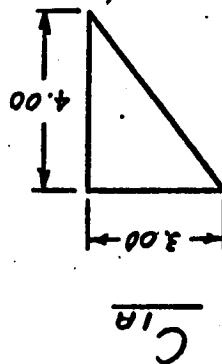


Figure 5. Vertical Tail and Dorsal Fin Geometry.





NOTE:  
DIMENSIONAL DATA  
IS IN INCHES

Figure 6. Canard Geometry.

**NOTE:**

1. ALL MODEL STATIONS, IN INCHES.
2. RADIAL POSITIONING OF NACELLE CONFIGURATIONS  $E_{18}$  AND  $E_{27}$  ARE THE SAME, HOWEVER THE INLET L.E. FOR  $E_{18}$  IS AT M.S. 15.73 AND FOR  $E_{27}$  AT M.S. 27.18

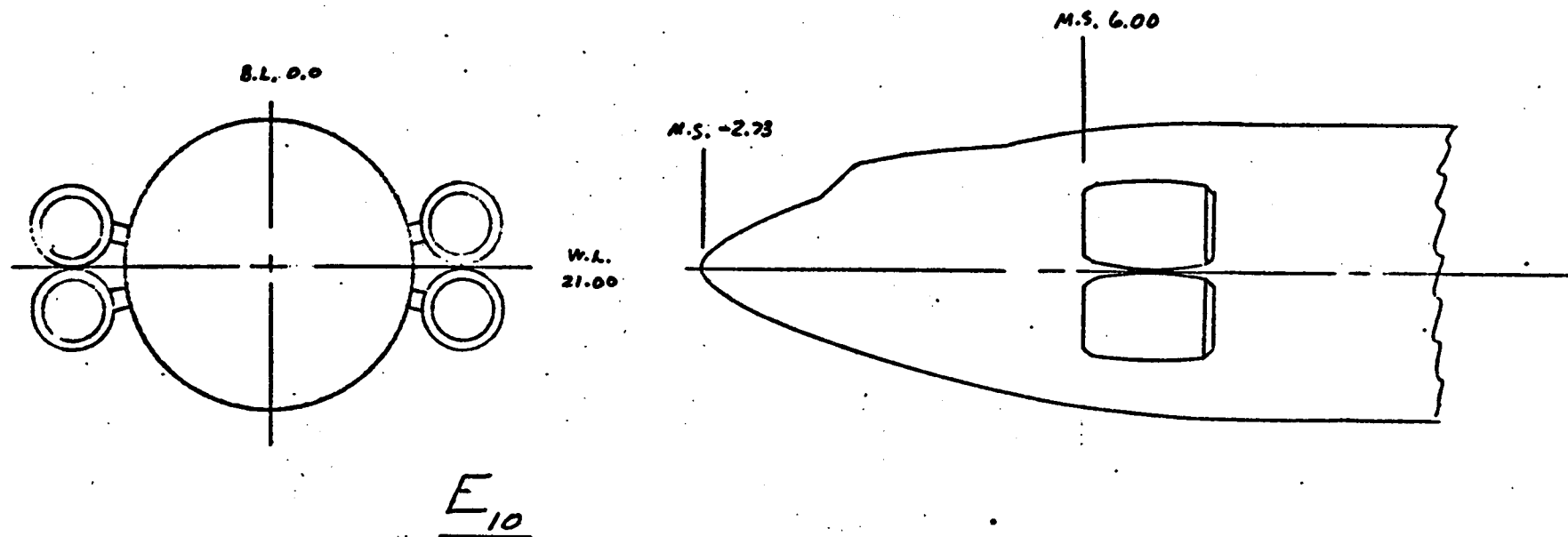


Figure 7. Typical Hi-Bypass Ratio Cruise Engine Nacelle Installation.

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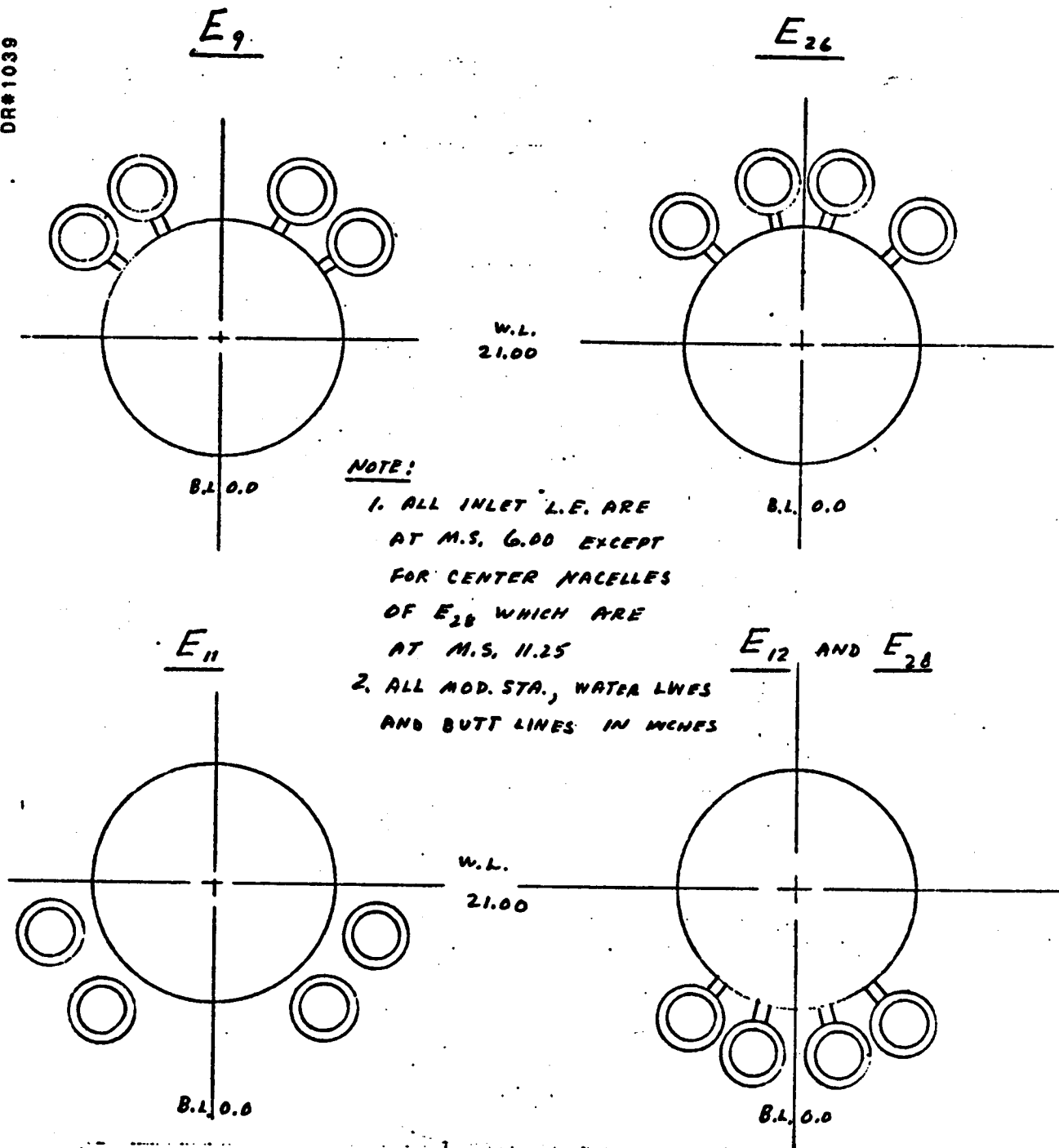
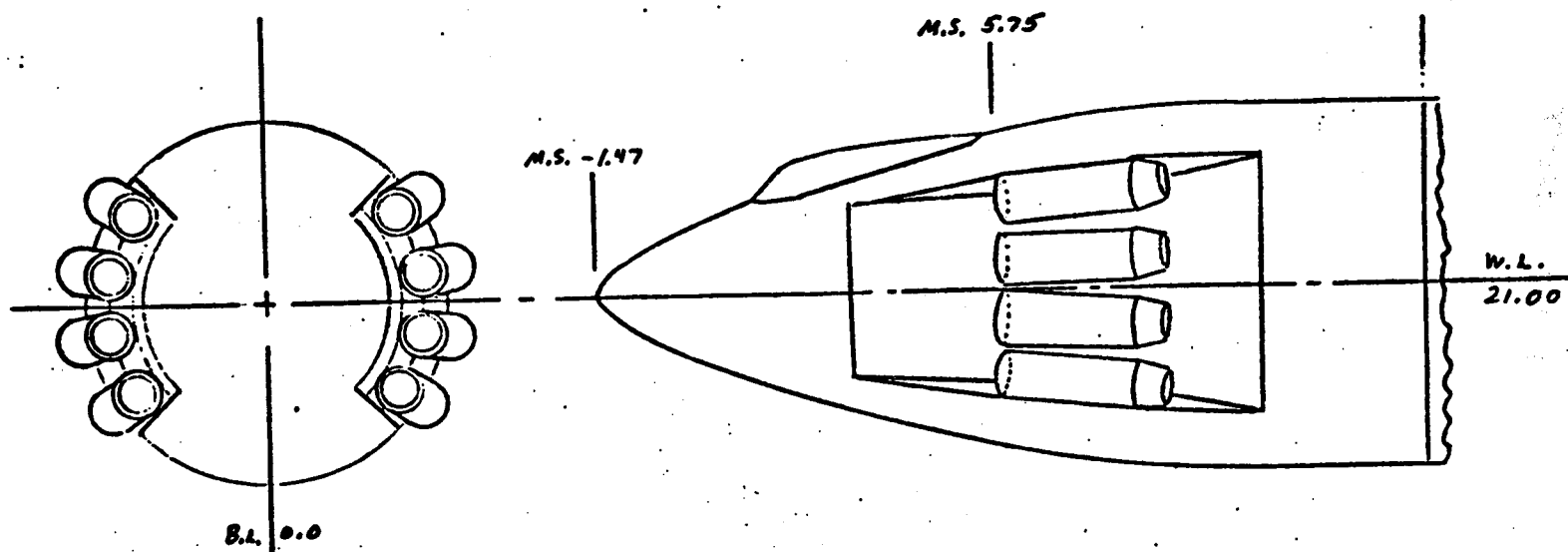


Figure 8. Hi-Bypass Ratio Cruise Engine Nacelle Radial Positions.

**NOTE:**

1. MODEL STATIONS, WATER LINES AND BUTT LINES IN INCHES.
2.  $E_{24}$  SAME AS  $E_{15}$  EXCEPT THAT INLET COVER PAIRINGS ARE SIMULATED
3.  $E_{25}$  SAME AS  $E_{15}$  EXCEPT FILLETS ARE USED BETWEEN NACELLES



$E_{15}$  ,  $E_{24}$  AND  $E_{25}$

Figure 9. Typical Semi-Submerged Low-Bypass Ratio Cruise Engine Nacelle Installation.

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NOTE:

1. MODEL STATIONS, WATER LINES  
AND BUTT LINES IN INCHES
2. INLET LEADING EDGE AT M.S. 5.75

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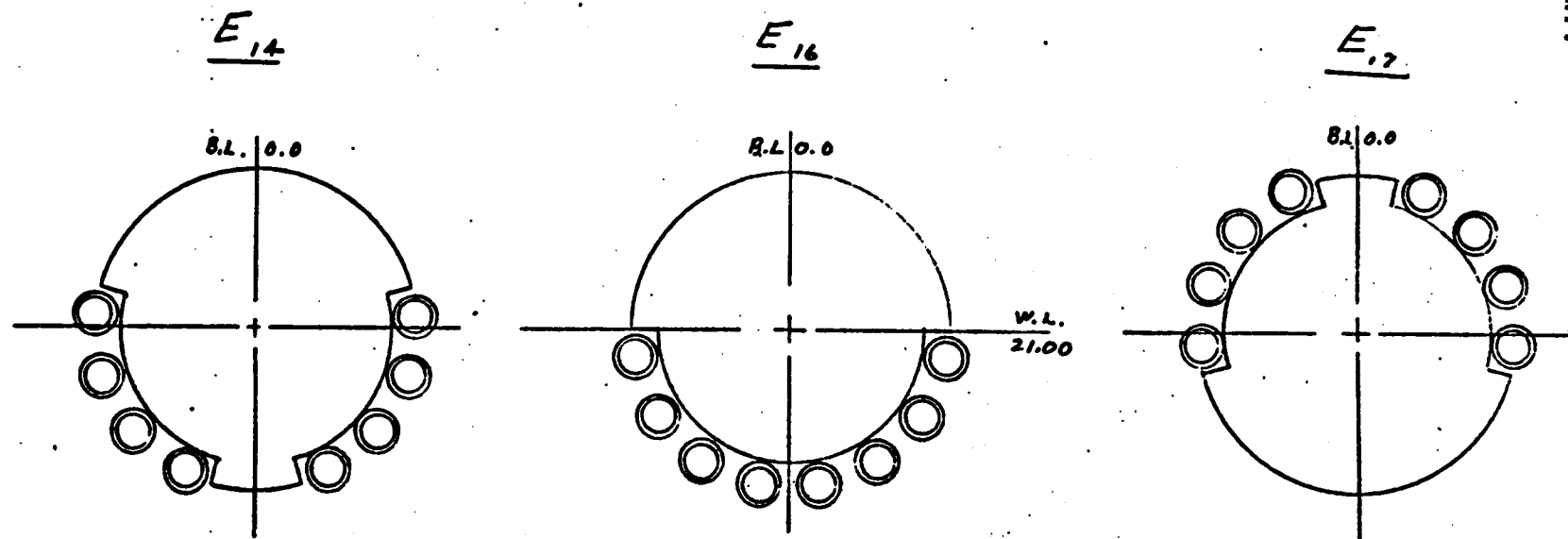


Figure 10. Semi-Submerged Low-Bypass Ratio Cruise Engine Nacelle Radial Position.

**NOTE:**

MODEL STATIONS, WATER LINES  
AND BUTT LINES IN INCHES

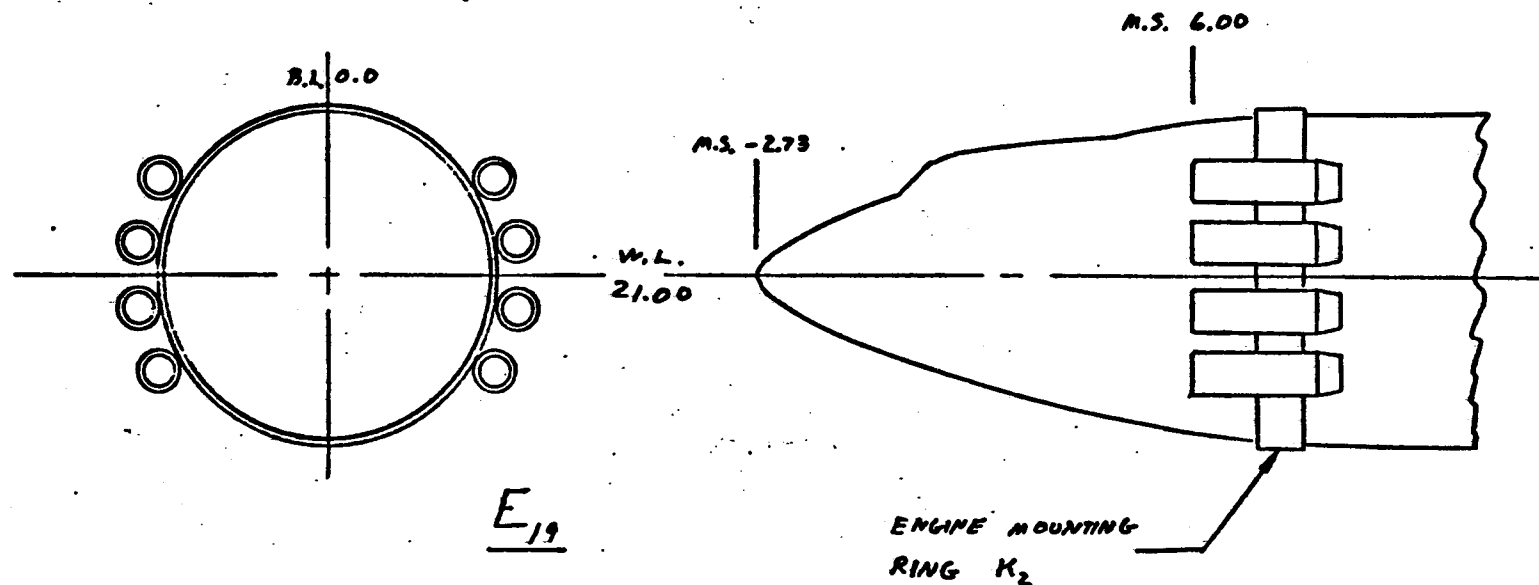


Figure 11. Typical Externally Mounted Low-Bypass Ratio Cruise Engine Nacelle Installation.

NOTE:

1. NACELLE INLET L.F.  
AT MODEL STATION 6.00
2. MODEL STATIONS, WATER LINES  
AND BUTT LINES IN INCHES

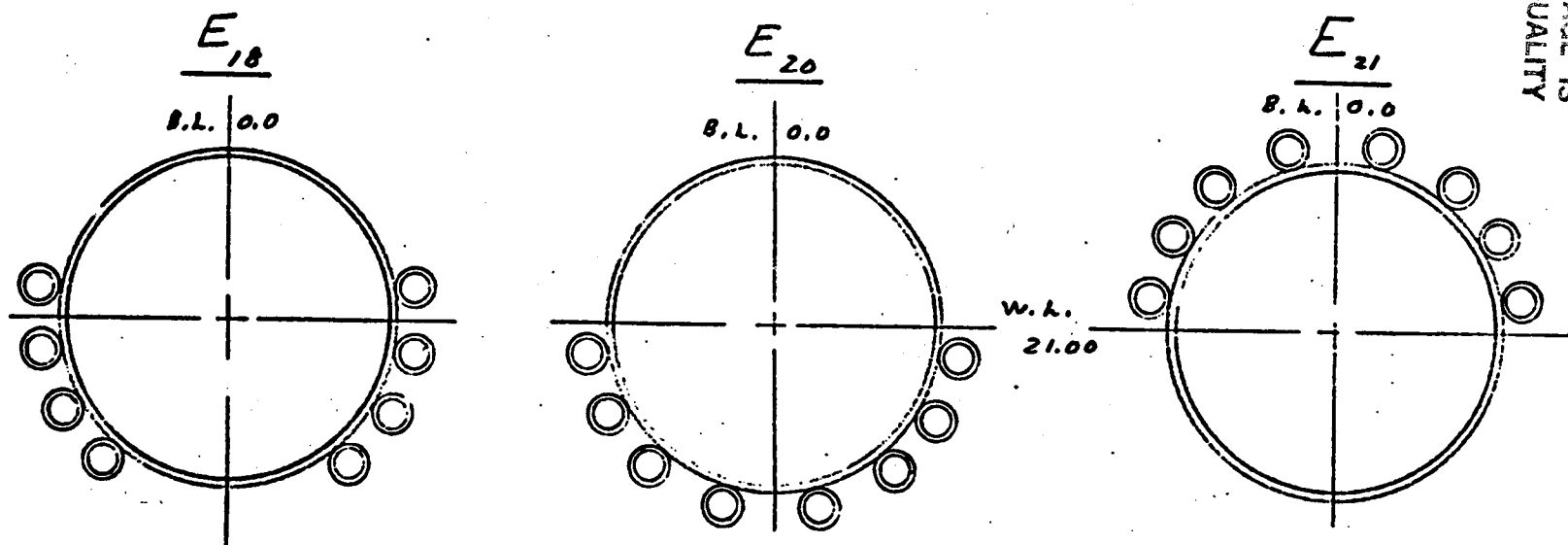


Figure 12. Externally Mounted Low-Bypass Ratio Cruise Engine Nacelle Radial Positions.

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☐ PRE-TEST  
☒ POST TEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL REFLECTION						NO. OF RUNS	Reynolds No. $\times 10^{-6}$ PER FOOT							
		$\alpha$	$\beta$	$L_c$	$\Delta L_c$	$S_{eL}$	$\Delta S_{eL}$	$S_{eR}$	$\Delta S_{eR}$		2.5	4.0	5.8	7.9	8.5	9.5	11.0	14.0
RLS001	$B_{19} W_{17} V_9 C_9 E_{31}$	A	0	0	0	0	0	0	0	7	1	2	3	4		5	6	7
RLS002				-5	0	0	0	0	0	1						8		
RLS003				+5	0	0	0	0	0	1						9		
RLS004				+10	0	0	0	0	0	1						10		
RLS005				+20	0	0	0	0	0	1						11		
RLS006	$B_{19} W_{17} V_9 E_{31}$			OFF	0	0	0	0	0	1						12		
RLS007	$B_{19} W_{17} V_9$			OFF	0	0	0	0	0	1						13		
RLS008	$B_{19} W_{17}$			OFF	0	0	0	0	OFF	1						14		
RLS009	$B_{19}$			OFF	OFF	OFF	OFF	OFF	OFF	1						15		
RLS010	$B_{19} W_{17} V_9 E_{31}$			OFF	-10	-10	-10	-10	0	1						16		
RLS011				OFF	-20	-20	-20	-20	0	1						17		
RLS012				OFF	+10	+10	+10	+10	0	1						18		
RLS013	$B_{19} W_{17} V_9 C_9 E_{31}$			0	+10	+10	+10	+10	0	1						19		
RLS014				+10	+10	+10	+10	+10	0	1						20		
RLS015				+20	+10	+10	+10	+10	0	3			21	22		23		
RLS016				+5	+10	+10	-10	-10	0	3			24	25		26		
RLS017				+5	+10	0	-10	0	0	2			27			28		
RLS018				+5	0	0	0	0	+10	3			29	30		31		
RLS019	$B_{20} W_{17} V_9 C_9 E_{31}$			+20	0	0	0	0	0	1						32		
RLS020				+10	0	0	0	0	0	1						33		

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
 BETA IQ(P,S,F)ICN: ICA ICLM CBL CYN ICY RN/L 8

Coefficients:

$\alpha$  or  $\beta$

Schedules

$A\alpha = -4.0$  TO  $+20.0$  ;  $\Delta\alpha = +2.0$  DEG  
 $B\alpha = +20.0$  TO  $+44.0$  ;  $\Delta\alpha = +2.0$  DEG  
 $+44.0$  TO  $+68.0$  ;  $\Delta\alpha = +2.0$  DEG

IDPVAR(1) IDPVAR(2) N DV

SHEET 1 OF 2



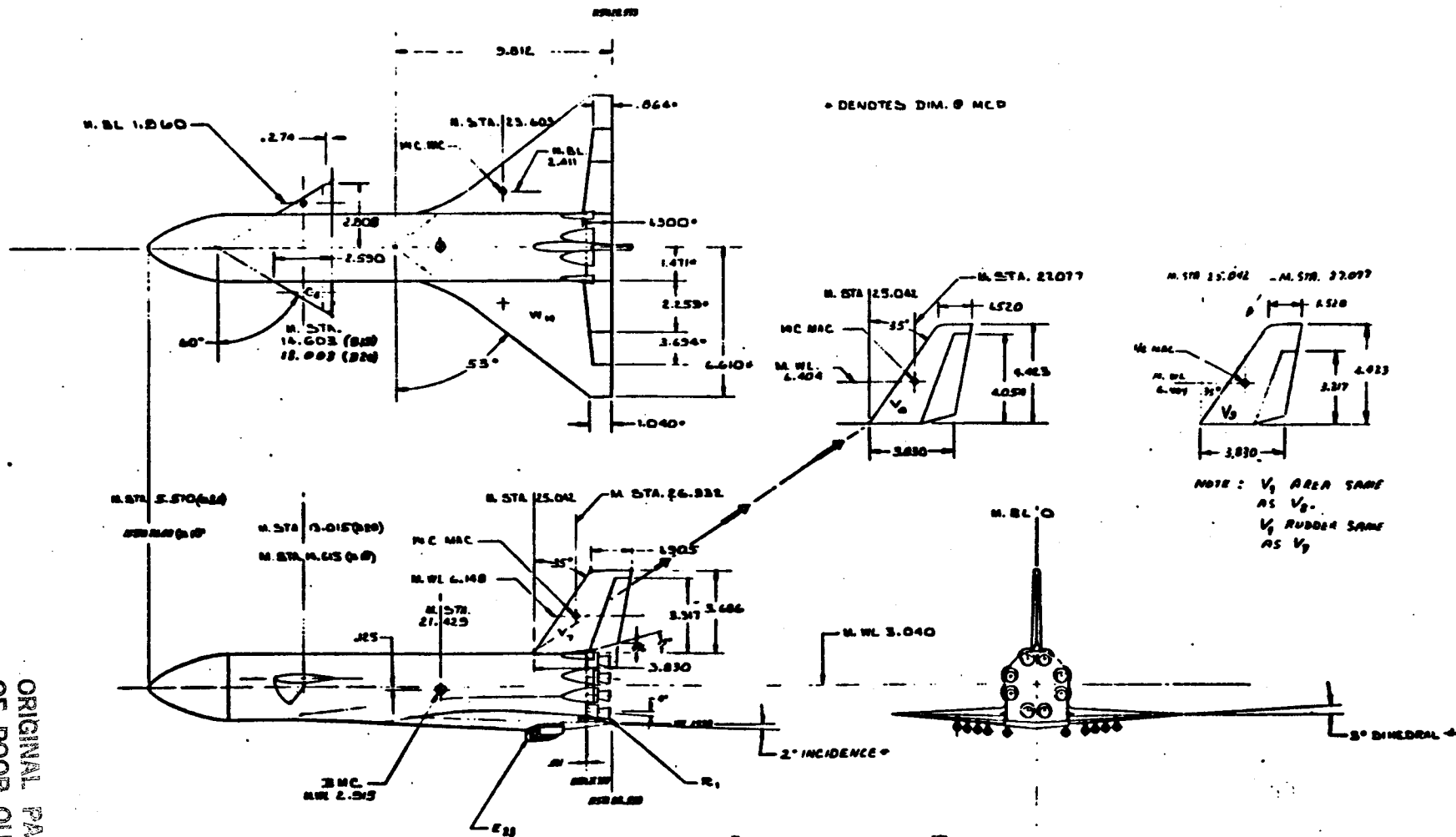
☐ PRE-TEST  
☒ POST TEST

DATA SET IDENTIFIER	CONFIGURATION	CONTROL DEFLECTION					NO. OF RUNS	REYNOLDS NO. $\times 10^{-6}$ PER FOOT				
		$\alpha$	$\beta$	$\delta_1$	$\delta_2$	$\delta_3$		2.5	4.0	5.8	7.9	8.5
RL5021	$B_0 W_0 V_0 C_0 E_0$	A	0	0	0	0	1					
RL5022	$B_0 W_0 V_0 E_0$			OFF	0	0	1					
RL5023	$B_0 W_0 V_0 C_0 E_0$			0	0	0	1					
RL5024	$B_0 W_0 V_0 C_0 E_0$			0	0	0	1					
RL5025	$B_0 W_0 V_0 C_0 E_0$			0	0	0	1					
RL5026	$B_0 W_0 V_0 E_0$			0	0	0	7	38	39	40	41	
RL5027	$B_0 W_0 V_0 C_0 E_0$			0	0	0	3			45	46	
RL5028	$B_0 W_0 V_0 C_0 E_0$			0	0	0	1					
RL5029	$B_0 W_0 V_0 C_0$			0	0	0	1					
RL5030				0	0	0	4	50	51	52		
RL5031				0	0	0	1					
RL5032				0	0	0	1					
RL5033				0	0	0	1					
RL5034				0	0	0	4	57	58	59		
RL5035				0	0	0	4	62	63	64		
RL5036				0	0	0	1					

1	7	13	19	25	31	37	43	49	55	61	67	73	79
Coefficients													
Schedules													
A $\Delta$ = -4.0    B $\Delta$ = +2.0    C $\Delta$ = +2.0    D $\Delta$ = +2.0    E $\Delta$ = +2.0    F $\Delta$ = +2.0    G $\Delta$ = +2.0    H $\Delta$ = +2.0    I $\Delta$ = +2.0    J $\Delta$ = +2.0    K $\Delta$ = +2.0    L $\Delta$ = +2.0    M $\Delta$ = +2.0    N $\Delta$ = +2.0    O $\Delta$ = +2.0    P $\Delta$ = +2.0    Q $\Delta$ = +2.0    R $\Delta$ = +2.0    S $\Delta$ = +2.0    T $\Delta$ = +2.0    U $\Delta$ = +2.0    V $\Delta$ = +2.0    W $\Delta$ = +2.0    X $\Delta$ = +2.0    Y $\Delta$ = +2.0    Z $\Delta$ = +2.0													
IDVAR(1) IDVAR(2) N DV													
8													

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**Figure 1. General Arrangement - 0.0076 Scale Space Shuttle Booster B-15B-1.**

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DELTA WING BOOSTER  
GD/C  
DR#1087 A-1-328

STR. STING TOT. BASE AREA = 8.666 IN<sup>2</sup>  
BLADE TOTAL BASE AREA = 8.452 IN<sup>2</sup>

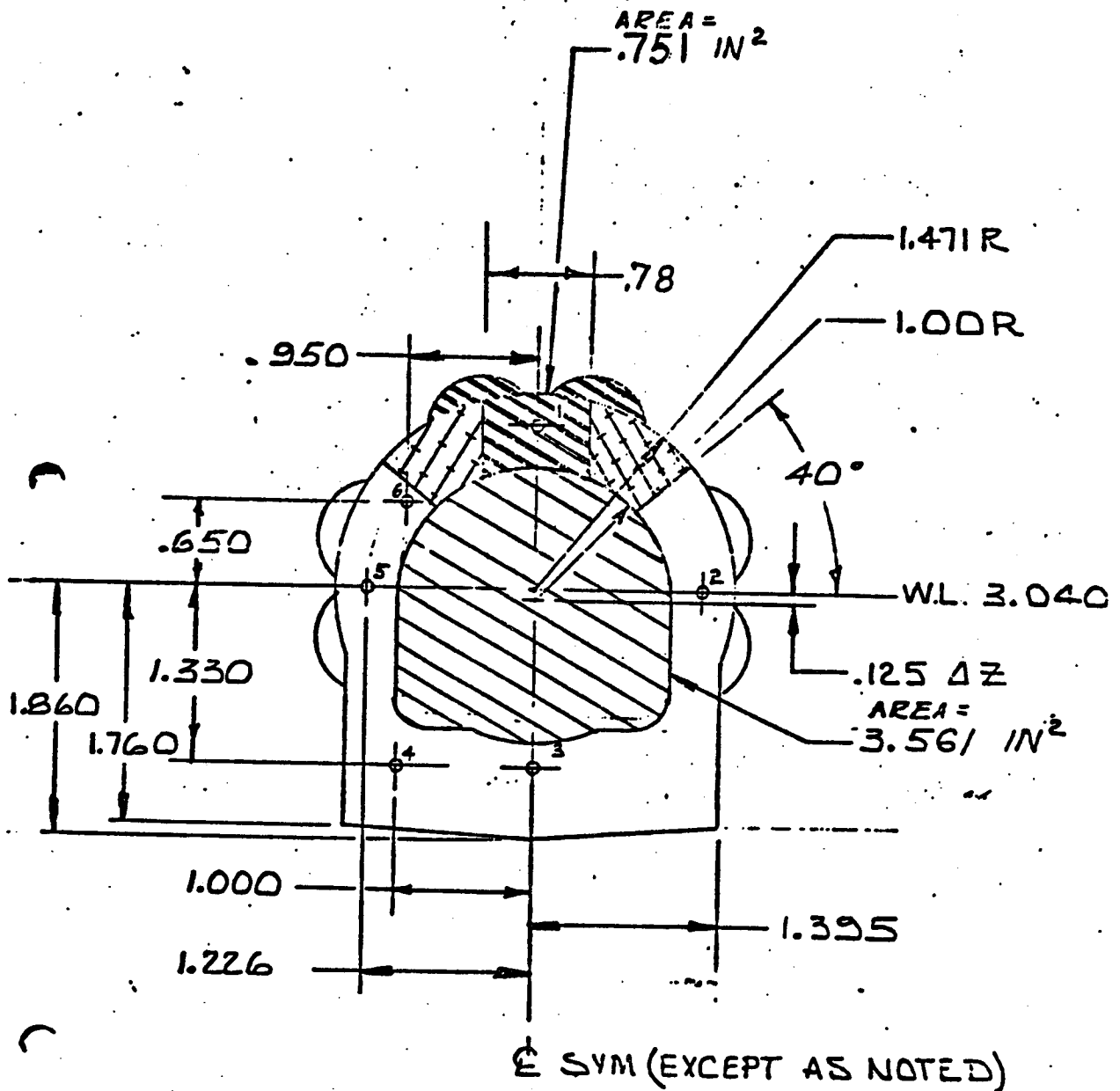


Figure 6. Base and Cavity Areas and Base Pressure Orifice Locations.

TEST CFHT-64 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	NO. of RUNS	PARAMETERS/VALUES								SIDESLIP ANGLE - BETA							
				S <sub>c</sub> S <sub>a</sub> S <sub>R</sub> S <sub>A</sub>				-5° -25° 0° 5°											
RLG200	B19	A	10	—	—	—	—	38		37									
100	B19 V <sub>2</sub>	A		—	—	0	—	36		35									
130	B19 V <sub>2</sub> C <sub>4</sub>	A		-30	—	0	—	34		33									
105	B19 V <sub>2</sub> W <sub>12</sub>	A		—	0	0	0	32		31									
155	B19 V <sub>2</sub> W <sub>12</sub> C <sub>4</sub>	A		0	0	0	0	4		3									
165		B		15	0	0	0	21	20	19									
135		A		-30	0	0	0	8		7	8*								
131		A		-30	-60	0	0	10		9									
132		A		-30	-40	0	0	12		11									
133		A		-30	-20	0	0	14		13									
134		A		-30	-10	0	0	16		15									
136		A		-30	10	0	0	18		17									
635		B		-30	0	10	0	70		69	71								
137		A		-30	0	0	10	73		72	74								
138		A		-30	-10	0	-10	76		75	77								
139		B		-30	5	0	-5	79		78	80								
125		A		-45	0	0	0	30		29									
115		B		-60	0	0	0	24	23	22									
116		A		-60	+10	0	0	26		25									
114		A		-60	-10	0	0	94		93									

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
C.N. ICA ICLM ICY ICYN CBL BETA Q(P.S.F.) BETA

COEFFICIENTS:

a or b

SCHEDULES

A = 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60

B = 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60

\* same as C.N. A except yaw, roll and sideslip data negative.

IDPVAR(1) IDPVAR(2) NDV

SHEET 1 of 3

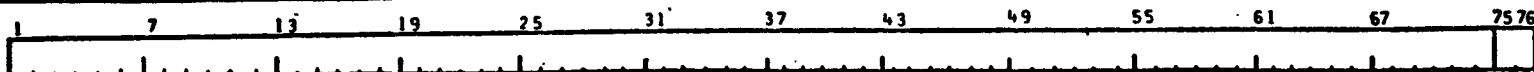
NASA-MSCF-MAN

# TEST CEHT-64 DATA SET COLLATION SHEET

DELTA WING BOOSTER  
GD/C  
DR#1093 A-1- 330

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	SIDESLIP ANGLE - BETA									
		A	B	Sc	Se	SR	SA		-5°	-2.5°	0°	5°						
RLG 113	B19 V7 W14 C4	A	10	-60	-20	0	0		28		27							
RR1		A		15	0	0	0		6		5							
175	↓	A		0/30	0	0	0		91		90	92						
735	B19 V7 W14 C4 F2	B		-30	0	0	0		82		81	83						
737		B		-30	0	0	10		85		84	86						
73A	↓	B		-30	-10	0	10		88		87	89						
300	B20	A		-	-	-	-		40		39							
500	B20 V8	A		-	-	0	-		42		41							
530	B20 V8 C4	A		-30	-	0	-		44		43							
510	↓	A		-60	-	0	-		96		95							
540		A		-15	-	0	-		98		97							
560	↓	A		15	-	0	-		100		99							
505	B20 V8 W14	A		-	0	0	0		46		45							
506	↓	A		-	10	0	0		48		47							
503	↓	A		-	-20	0	0		50		49							
514	B20 V8 W14 C4	A		-60	0	0	0		52		51							
535		A		-30	0	0	0		56		55							
536		A		-30	10	0	0		58		57							
534		A		-30	-10	0	0		60		59							
533	↓	A		-30	-20	0	0		62		61							



COEFFICIENTS: \_\_\_\_\_ IDPVAR(1) IDPVAR(2) NDV

a or B  
SCHEDULES

SHEET 2 of 3.

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TEST CFHT-64 DATA SET COLLATION SHEET

## A POSTTEST

[illegible]

**Q O R**

## SCHEDULES

**SHEET 3 of 3.**

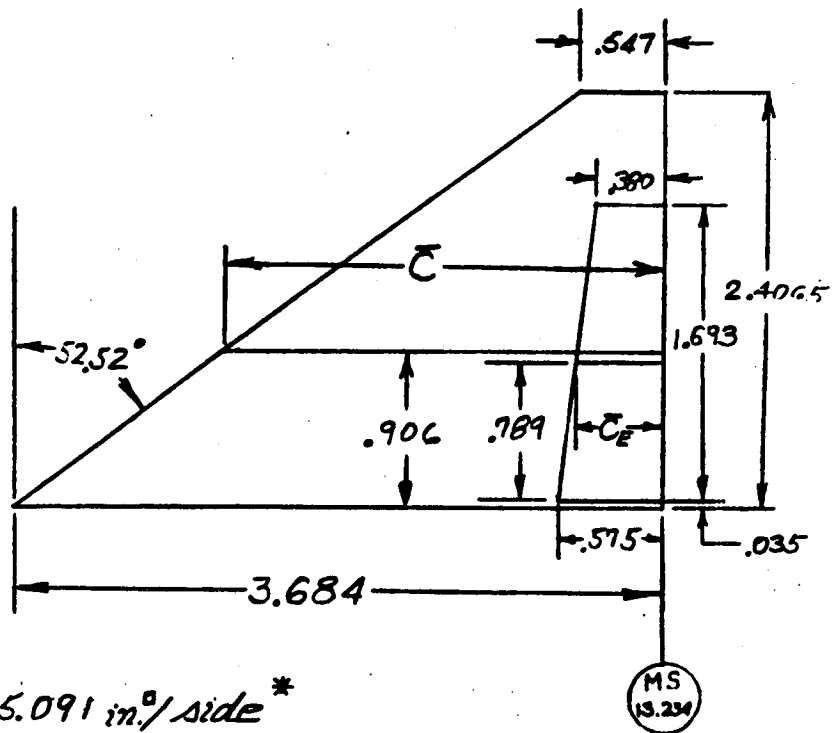
**NASA-MSFC-MAF**



# (COMPONENT SKETCHES)

W14

DELTA WING BOOSTER  
GD/C  
DR#1093 A-1- 333



$\lambda(\text{EXP}) = .14848$   
EXPOSED AREA = 5.091 in.<sup>2</sup>/side \*  
 $\bar{C} = 2.503 \text{ in.}$

## ELEVON

AREA = .808 in.<sup>2</sup>/side  
 $\bar{C}_E = .484 \text{ in.}$

FIGURE 5 WING, W14

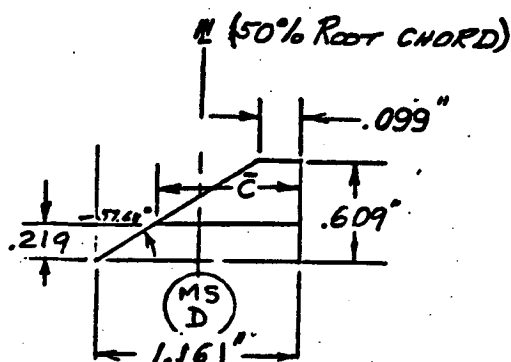
\* INCLUDES .044 in.<sup>2</sup> SINCE BODY IS .065 in LONGER WITH WING.



C4

✓ COMPONENT SKETCHES

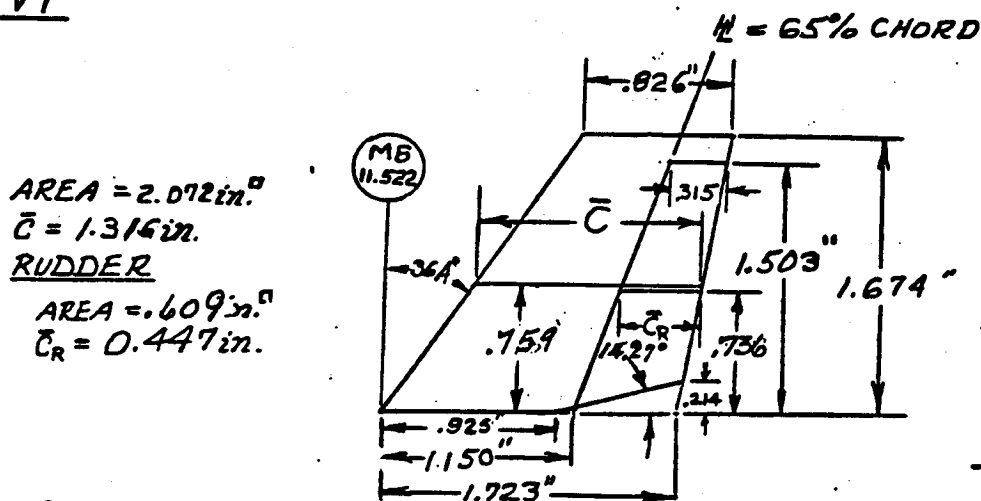
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EXPOSED AREA = 0.3837 in<sup>2</sup>/side

$$\bar{C} = 0.779 \text{ in.}$$
$$D = 6.754 \text{ on } B_{19}$$
$$= 6.017 \text{ on } B_{20}$$

V7


$$\angle_{TE} = 11.350^\circ$$
V8
$$AREA = 2.326 \text{ in.}^2$$

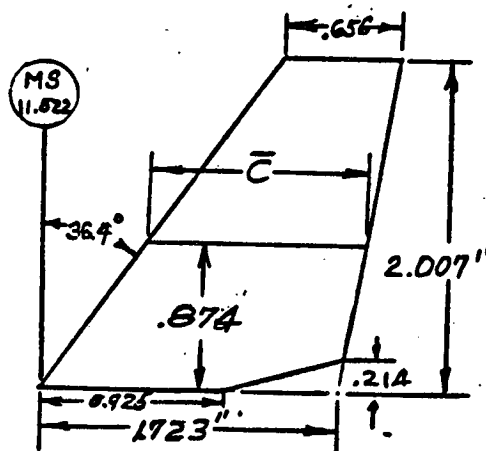
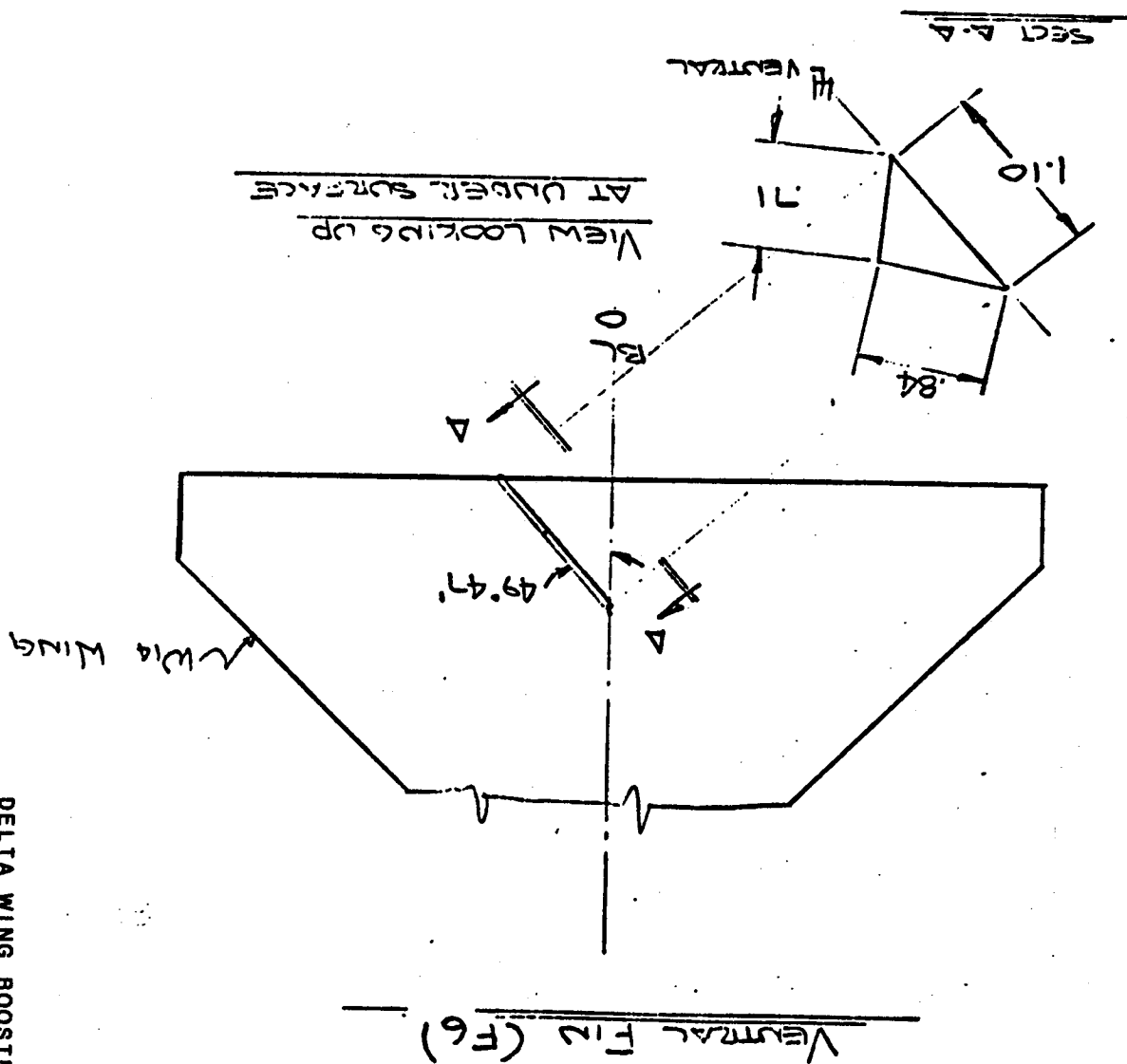
$$\bar{C} = 1.062 \text{ in.}$$


FIGURE 6, CANARD  $C_4$ , VERTICAL TAILS  $V_7$  AND  $V_8$

FIGURE 7, VENTRAL FIN,  $F_c$



DELTA WING BOOSTER  
GD/C  
DR#1093 A-1- 335

TABLE II. TEST MSFC TWT 48 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)															
		a	B	$\delta_{CL}$	$\delta_{CF}$	$\delta_{CL}$	$\delta_{CF}$		0.60	0.90	0.95	1.00	1.05	1.10	1.20	1.50	2.00	3.00	4.00	5.00				
R28B11	B19V7	A	0°	-	-	-	-		28	27	26	25	24	23	22	87	88	129	123	122				
R28B12	B19	B		-	-	-	-											153						
R28B13	B19	C		-	-	-	-											156		151				
R28B21	B19W14V7	A		0	0	-	-		15	16	17	18	19	20	21	86	89	119	110	121				
R28B22	B19W14	B'		0	0	-	-											171		170				
R28B31	B19W14C4AV7	A		0	0	0	0		14	13	12	11	10	9	8	83	91	118	117	116				
R28B32	B19W14C4A	B		0	0	0	0											136	141	142				
R28B33	B19W14C4A	C		0	0	0	0											146	142	143				
R28C41	B19W14C4AV7	A		0	0	-30	-30			29	30		31		32	84	92	113	114	115				
R28C42	B19W14C4A	B'		0	0	-30	-30																	
R28C44	B19W14C4AV7	A		0	0	+15	+15			36	35		34		33	85	90	112	111	174				
R28C45	B19W14C4A	B'		0	0	+15	+15											117		176				
R28C47	B19W14C4AV7	A		0	0	-60	-60			37			38											
R28C48	B19W14C4A	B'		0	0	-60	-60																	
R28E71	B19W14C4AV7	A		-20	-20	0	0			39		40			41		93	179	106	178				
R28E72	B19W14C4A	B'		-20	-20	0	0																	
R28E74	B19W14C4AV7	A		-60	-60	0	0			42		43			44		94	181	105	180				
R28E75	B19W14C4A	B'		-60	-60	0	0																	
R28L71	B20W14C4BV7	A		0	0	0	0			45		46			47		95	183		182				
R28L72	B20W14C4B	B'		0	0	0	0											186						

1	7	13	19	25	31	37	43	49	55	61	67	75.76
CLM	ICM	CYN	CY	CBL	CA	CAB	CPI	CP2	CPC			

COEFFICIENTS:

A OR B

SCHEDULES

$\alpha A = +6, 8, 10, 12, 14, 16, 18, 20, 22$  DEG.

$\alpha B = +25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45$  DEG.

$\alpha C = +45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65$  DEG.

$\alpha B' = +30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50$  DEG.

DPVAR(1) DPVAR(2) NDV

MACH NO.

A OR B

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TABLE II. (CONTINUED)  
TEST MSFC TWT 481 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)											
		a	B	$\delta_{cl}$	$\delta_{cr}$	$\delta_{cl}$	$\delta_{cr}$		0.60	0.90	0.95	1.00	1.05	1.10	1.20	1.50	2.00	3.00	4.00	5.00
R28A01	B19W14C4AV7	A	0	0	-20	0	0			48		49			50		96			
R28A02	B19W14C4A	B'																185		186
R28W11	B19C4AV7	A			-	-				51		52			53		97			
R28W12	B19C4A	B			-	-												148		149
R28W13	B19C4A	C			-	-												149		150
R28Y21	B19W14C4AV7	15	D	0	0					59	58	57	56	55	54	82	98	104		
R28Y22	B19W14C4AV7 ( $\frac{\delta_{cl}}{\delta_{cr}} = 10$ )									71			60		61	80		101		
R28Y23	B19W14C4AV7					-30	-30			69			63		62	81		102		
R28Y24	B19W14C4AV7				-20	0	0			65			66		67	78		103		
R28Y31	B19W14C4A				0	0	0			73	72	71	70	69	68	79	99	100		
R28Y41	B19W14C4A	35		0	0	0	0											158		159
R28Y42	B19W14C4A			0	-20	0	0											155		156
R28E71	B19W14C4AV7	A	0	+10	+10	0	0			74		75			76			155		156
R28E78	B19W14C4A	B'	0	+10	+10	0	0											107		
R28C51	B19W14C4A	B'	0	0	0	0	0											173		174
R28F01	B19W14C4AF6	B'	0	-90	-90	+15	+15											188		
R28Y43	B19W14C4A	35	D	+10	-10	0	0											140	165	141
R28Y44	B19W14C4A			0	0	-30	0											166		
R28G01	B19W14C4AV7	A	0	0	0	0	0		1	2	3	4	5	6	7					

17

13

19

25

31

37

43

49

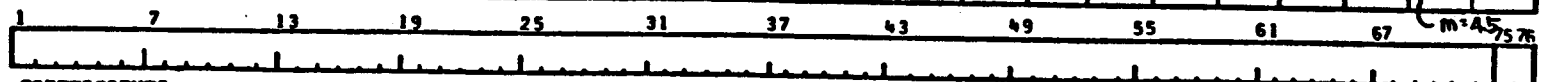
55

61

67

M=45

7576



COEFFICIENTS:

A or B  
SCHEDULES

$\beta D = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10$  DEG.

IDPVAR(1) IDPVAR(2) INDV

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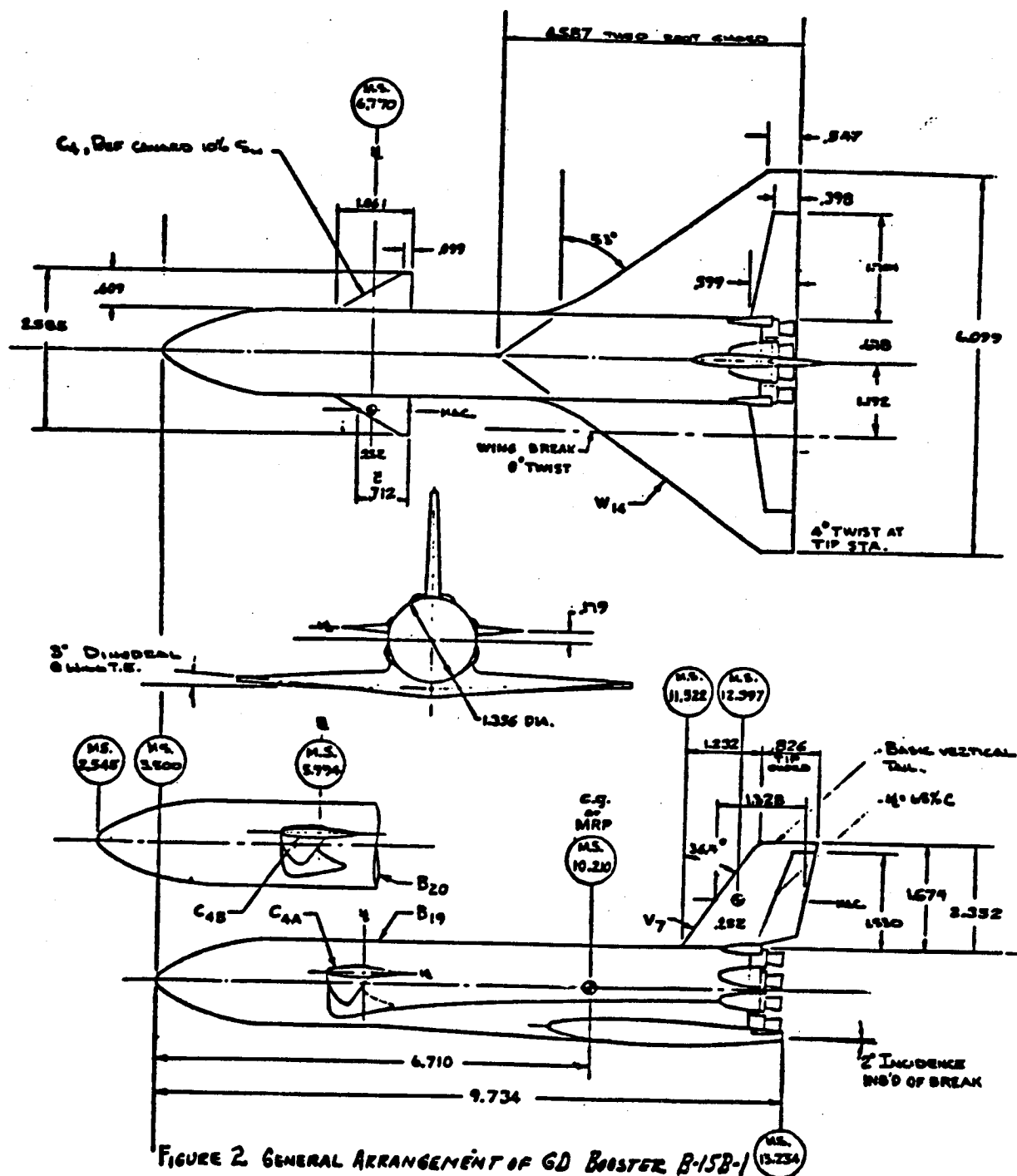
TABLE II. (CONCLUDED)  
TEST MSFC TWT 481 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)													
		$\alpha$	$\beta$	$\delta_{CL}$	$\delta_{FW}$	$\delta_{CL}$	$\delta_{CD}$		2.60	0.90	0.95	1.00	1.05	1.10	1.20	1.50	2.00	3.00	4.50	5.00		
R28Y61	B19W14C4A	35	D	0	0	-45	-45														168	
R28Y62	B19W14C4AF4																	158			157	
R28Y63	B19W14C4AF5																	160			159	
R28Y64	B19W14C4AF6																	162	161			
R28Y65	B19W14C4S																	164			163	
R28C50	B19W14C4AV7	A	0	0	0	-45	-45											107	108	109		
R28B14	B19	E	0	0	0	0	0		203	202				201		200	216					
R28B15	B19C4A								205	205				206		207	215					
R28B16	B19W14								198	199				200		209	214					
R28B17	B19W14C4A								197	196				195								
R28B18			6°						133	134				135		118	127					
R28B19	B19W14C4AV7		6°						132	131				130		129	126					
R28B20			0						109	106				101		210	213					
R28Y53		0	D						194	193				192		211	212					

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
CLM CN CYN CY CBL CA CAB CPI CP2 CPC  
COEFFICIENTS:  $\alpha$  or  $\beta$   
SCHEDULES  $\alpha E = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10 \text{ DEG.}$   
MACH NO.  $\alpha$  OR  $\beta$   
IDPVAR(1) IDPVAR(2) INDV

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NOSE FLAP (F4)

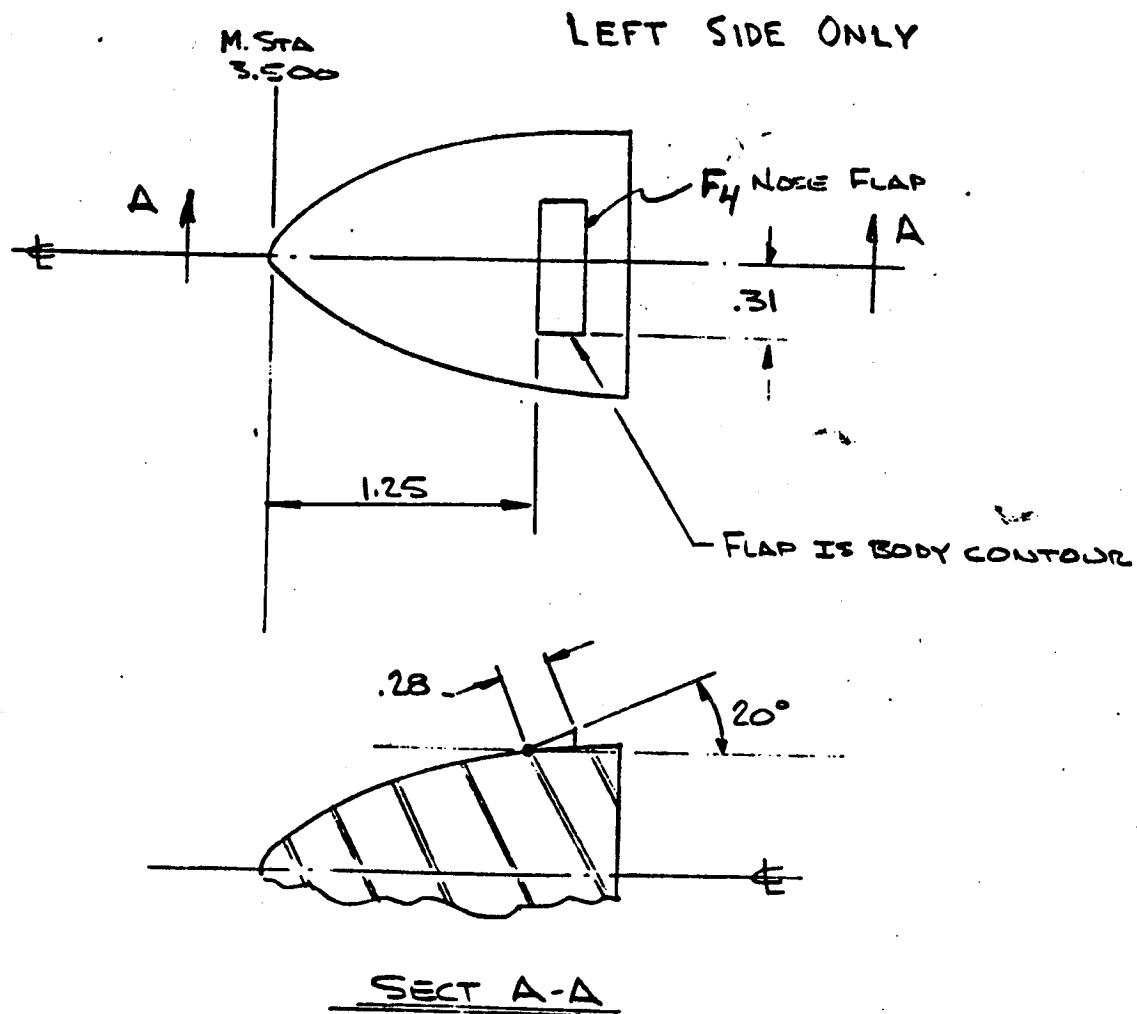
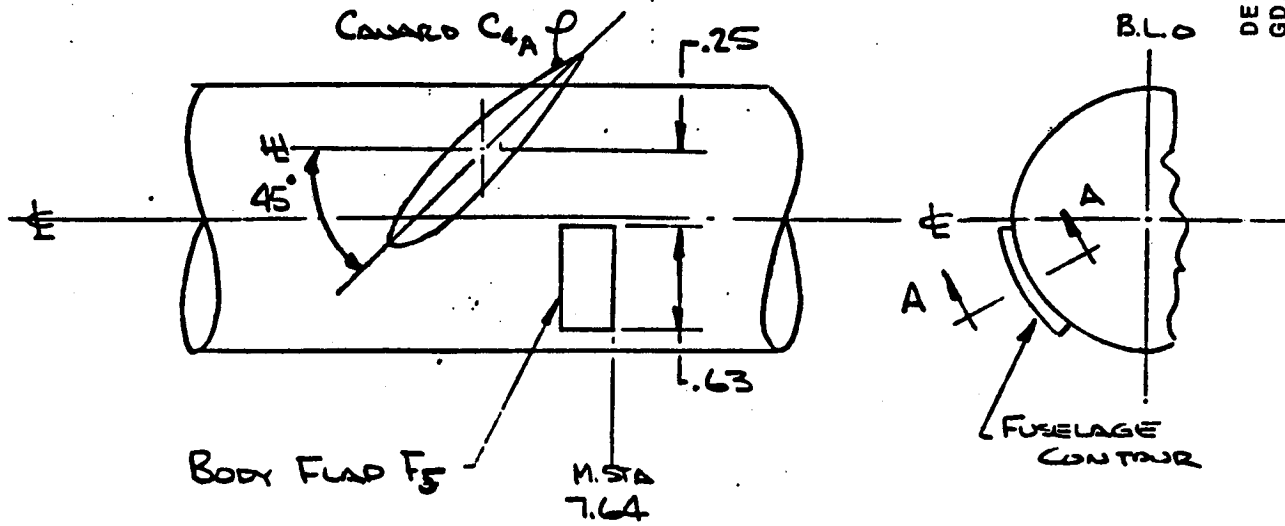
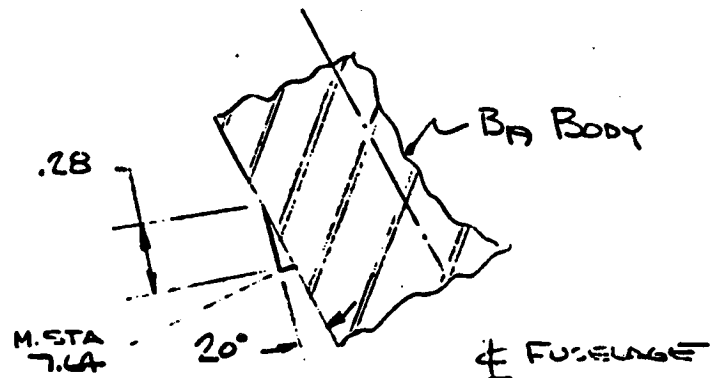


FIGURE 13. NOSE FLAP F4

BODY FLAP (F5)



LEFT SIDE ONLY



SECT A-A

FIGURE 14, BODY FLAP F5



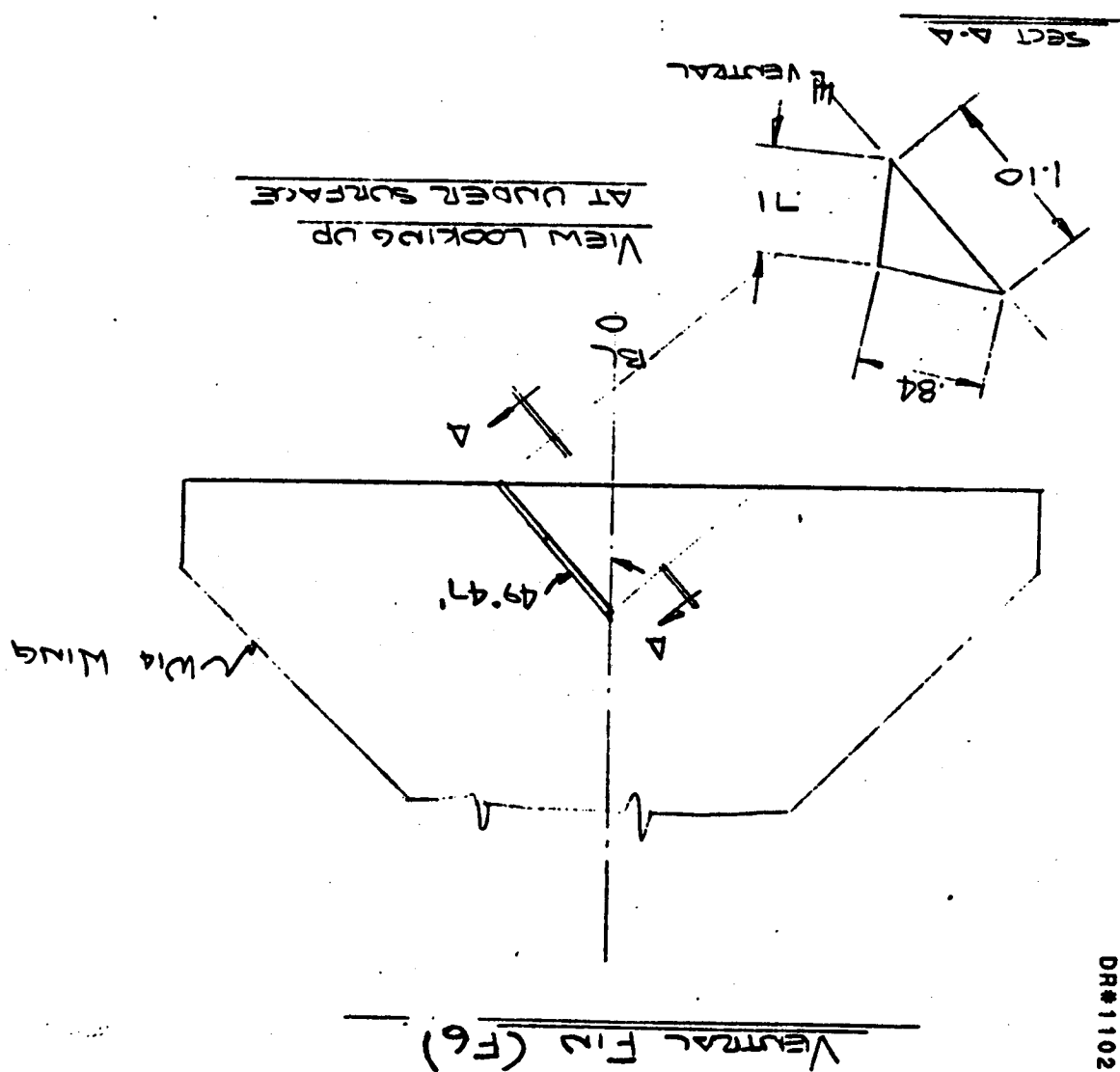
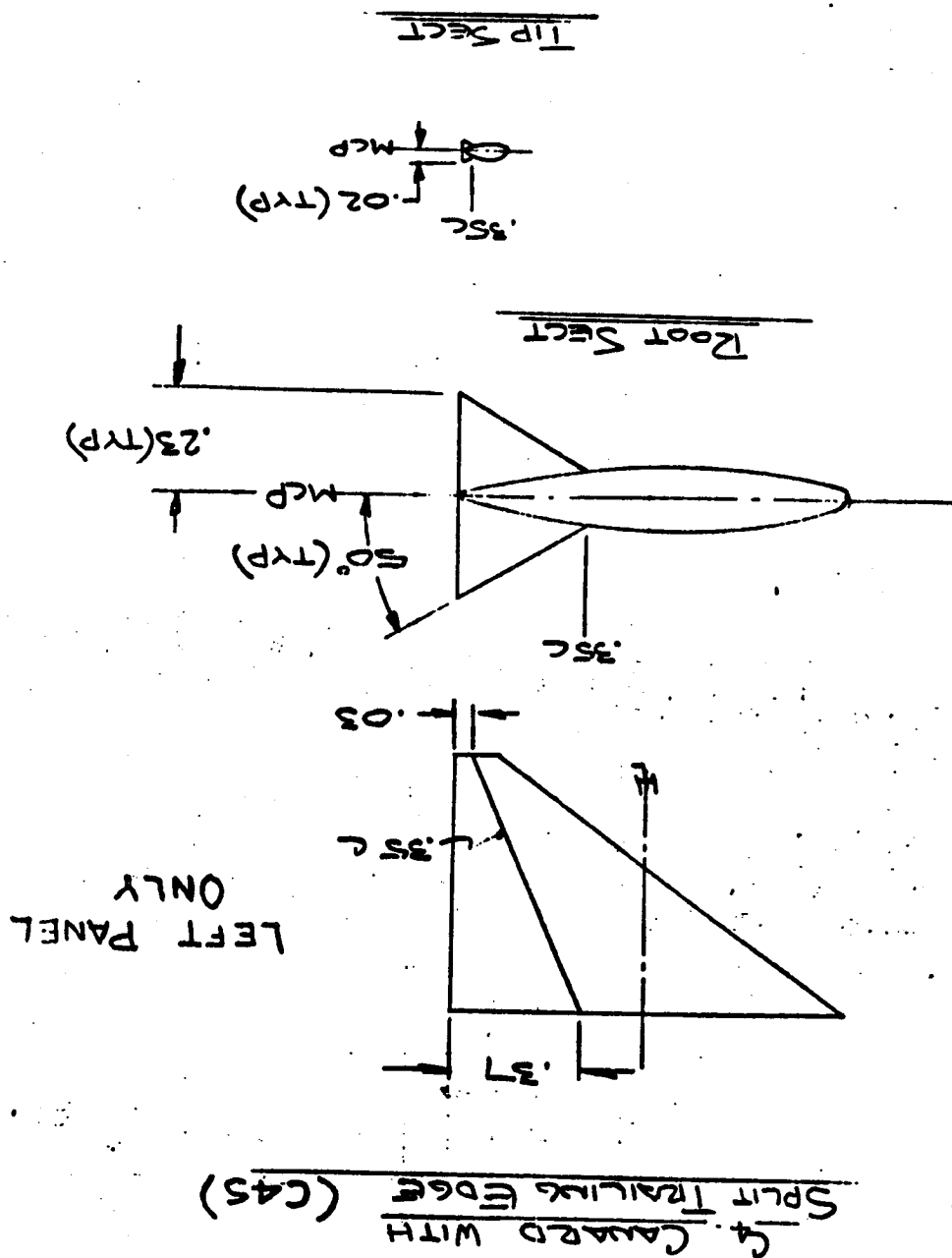


FIGURE 15. VENTRAL FIN F6

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FIGURE 16. CH CANARD WITH SPLIT TRAILING EDGE CHS



DELTA WING BOOSTER  
GD/C  
DR#1102 A-1- 343

TEST GDST 587-0 DATA SET COLLATION SHEET

DELTA WING BOOSTER  
GD/C

DR#1109 A-1- 344

☐ PRETEST

☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	CANARD											
		$\alpha$	$\beta$	$\delta e_L$	$\delta e_R$	$\delta c_L$	$\delta c_R$		1	2	3	4	5	6	7	8	9	10	11	12
RCMA01	B19W10V7P1C4	A	0	0/0	0/0	0/0	0/0	1	1											
RCMA02			4					1	2											
RCMA03			8					1	3											
RCMA04			0			20/0	20/0	1	4											
RCMA05			4					1	5											
RCMA06			8					1	6											
RCMA07	B19W10V7 C4		0					5	7	22	31	81				68				
RCMA08			4					5	8	23	32	82				69				
RCMA09			8					5	9	24	33	83				70				
RCMA10			0			0/0	0/0	5	10	19	28	78				65				
RCMA11			4					5	11	20	29	79				66				
RCMA12			8					5	12	21	30	80				67				
RCMA13	B19W10V7P1E32C4		0					1	34											
RCMA14			4					1	35											
RCMA15			8					1	36											
RCMA16	B19W10V7P1E31C4		0					1	37											
RCMA17			4					1	38											
RCMA18			8					1	39											
RCMA19	B19W10-1 V7C4		0					1								63				
RCMA20	B19W10-2 V7C4		0					1								64				

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
C L C Y C D C SL C L M C L N C AC C AB C A C N C A N A R D A L P H A 1 0

COEFFICIENTS:  $A\alpha = -4$  to  $+24^\circ$  @  $\Delta\alpha \approx 2^\circ$  IDPVAR(1) IDPVAR(2) NDV

$\alpha$  or  $\beta$   
SCHEDULES

NASA-MSFC-MAF

☐ PRETEST

☐ POSTTEST

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CL	KY	CD	CSL	CLM	CLN	CAC	CAB	CA	CN	CANARDALPHA			
COEFFICIENTS:													
a or b $Aa = -4 \tau_0 + 24^\circ @ \Delta a = 2^\circ$ $\rightarrow  IDPVAR(1)  IDPVAR(2)   INDV$													
SCHEDULES													

DELTA WING BOOSTER  
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DR#1109      A-1- 345

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☐ PRETEST

☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION				NO. OF RUNS	
REM A 44	B19W10V7C6	A	%	%	%	%	3	72
REM A 45						0%	3	75
REM A 46						0%	1	84
REM A 47						0%	1	85

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**NASA-MSFC-MAP**

TEST GDIST 587-0 DATA SET COLLATION SHEET

☐ PRETEST  
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION				NO. of RUNS	BETA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
			$\alpha$	$\delta E_L$	$\delta E_R$	$\delta C_L$		$\delta C_R$																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
RCMA 50	B19 W10	A		%	%	-	-	3	45	46	47																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
CL CY CD CSL CLM CLN CAC CAB CA CN BETA ALPHA 10  
COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

$\alpha$  or  $\beta$   
SCHEDULES

$$A^a = -4 T_c + 24^\circ @ \Delta a = 2^\circ$$

NASA-MSFC-MAP

# TEST GDLST 587-0 DATA SET COLLATION SHEET

DELTA WING BOOSTER  
GD/C  
DR#1109 A-1- 348

☐ PRETEST  
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION				NO. of RUNS	BETA												POST TEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
			$\alpha$	$\delta E_L$	$\delta E_R$	$\delta C_L$		$\delta C_R$	0°	4°	8°																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
RCMA 70	B19W10-4V7C4(Pos.1)	A		0%	0%	20%	20%	1	113																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CL	CY	CD	CSL	CLM	CLN	CAC	CAB	CA	CN	BETA	ALPHA	10	

COEFFICIENTS:

$\alpha$  or  $\beta$

SCHEDULES

$$A\alpha = -4 \text{ to } +24^\circ @ \Delta\alpha = 2^\circ$$

→ IDPVAR(1) IDPVAR(2) NDV

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## □ POSTTEST

1	7	13	19	25	31	37	43	49	55	61	67	73	79	
CL	CY	CD	CSL	CLM	CLN	CAC	CAB	CA	CN	BETA	ALPHA	10		
COEFFICIENTS:												IDPVAR(1)	IDPVAR(2)	IDV
α or β												Aα = -4 to 24° @ Δα = 2°		
SCHEDULES														

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DELTA WING BOOSTER  
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TEST GDLST 587-0 DATA SET COLLATION SHEET

DELTA WING BOOSTER  
GD/C  
DR#1109      A-1- 350

☐ PRETEST

## POSTTEST

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1. 7 13 19 25 31 37 43 49 55 61 67 75 76  
CL CY CD CSL CLM CLN CAC CAB CA CN CANARDALPHA 10  
COEFFICIENTS: \_\_\_\_\_  
a or b \_\_\_\_\_ IDPVAR(1) IDPVAR(2) NDV

## α or β SCHEDULES

$$A_a = -4 \text{ t}_b + 24^\circ @ \Delta a = 2^\circ$$

**NASA-MSFC-MAF**



DELTA WING BOOSTER  
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DR#1109 A-1- 352

☐ PRETEST

☐ POSTTEST

TEST 587-0 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION NO.	NO. OF RUNS	0°	4°	8°	BETA
RCMD01	B19W12V7P1Q4 (Pos. 1)	A	%	%	%	%	3	190
RCMD02	B19W12V7Q4 (Pos. 1)						3	193
RCMD03	B19W12V7Q5 (Pos. 1)						3	196
RCMD04	B19W12V7Q7 (Pos. 1)						3	199
RCMD05	B19W12V7						3	203
RCMD06	B19W12-1V7Q4 (Pos. 1)						3	206
RCMD07							3	210
RCMD08							3	213
RCMD09	B19W12-1V7						3	216
RCMD10	B19W12-1						3	219
RCMD11	B19W12-1V7Q4 (Pos. 2)						3	220
RCMD12	B19W12-1V7Q4 (Pos. 8)						1	223
RCMD13	B19W12-1V7Q5 (Pos. 1)						1	224

CL	CY	GD	GSL	GLM	GLN	GAG	GAB	GA	GN	BETA	ALPHA	ID
1	7	13	19	25	31	37	43	49	55	61	67	75 76

COEFFICIENTS:  
a or b  
SCHEDULES

Note: CHANGED POSITION 1 IS ASSUMED UNLESS STATED

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NOTE: 1. GAT TO BE USED ON ROOF  
2. GAT TO BE USED ON OTHER SURFACES  
3. WIDTH OF GAT TO BE 1/2" - 1" DEPT. 1/2"  
FROM LE ADJACENT TO FLOW DIRECTION  
4. GAT POSITION IS IN POSITION 2  
WITHOUT A CHANGING AIRING

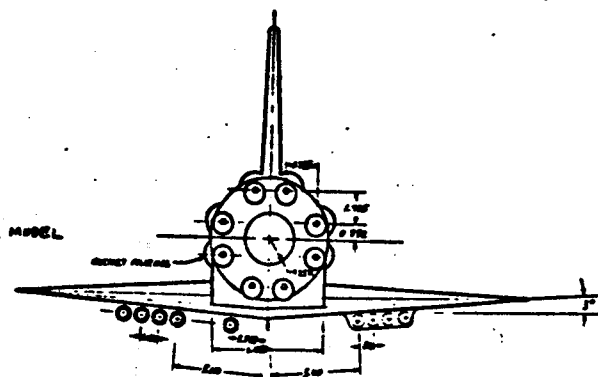


Figure 2. Three-View of the 0.0175 Scale B-15 B Booster Model.

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DR#1109      A-1- 353

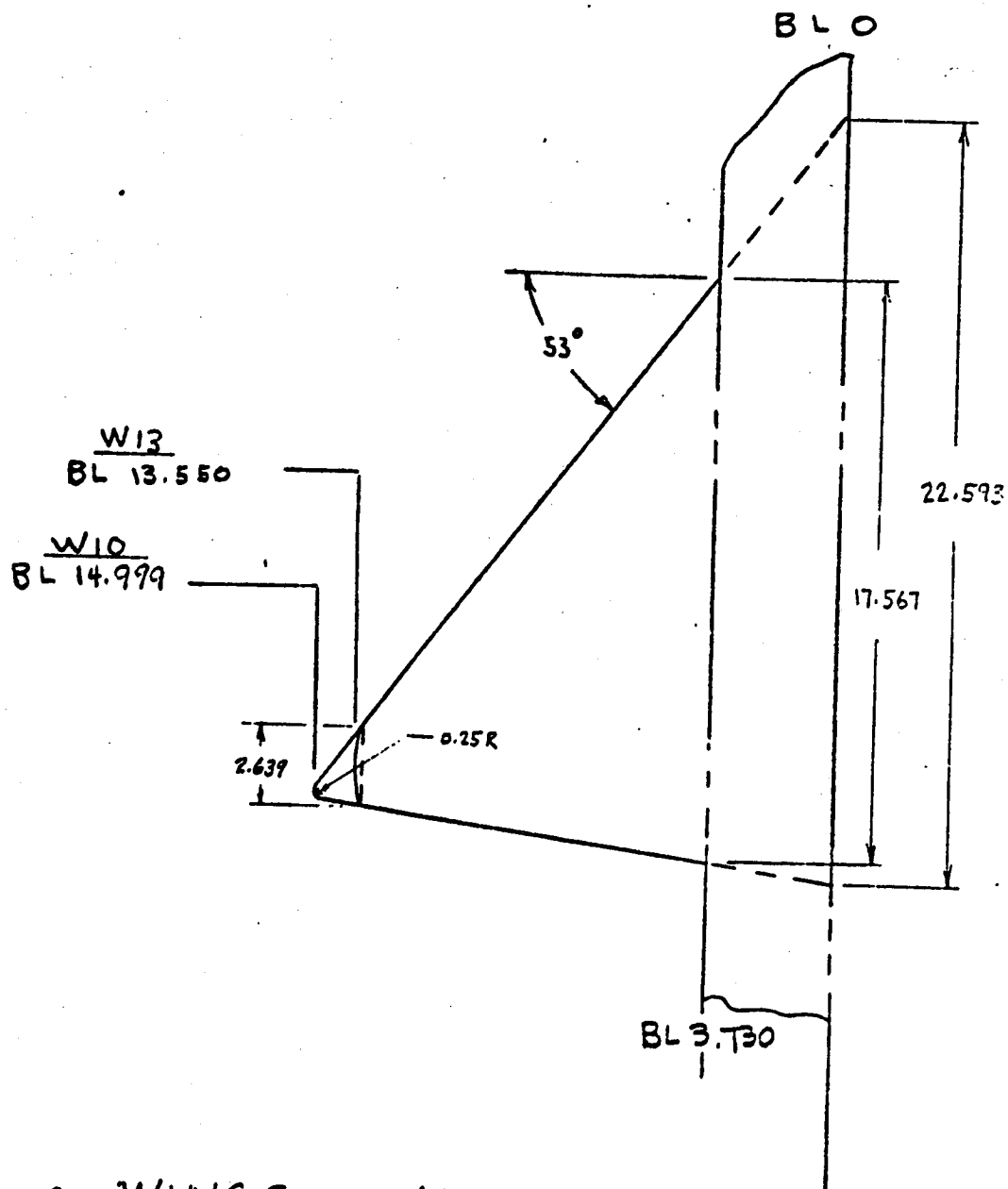
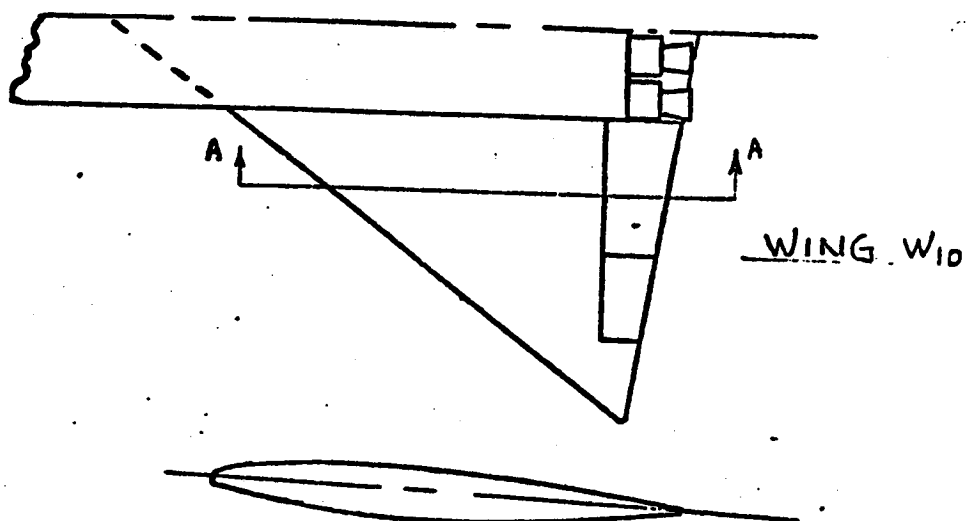
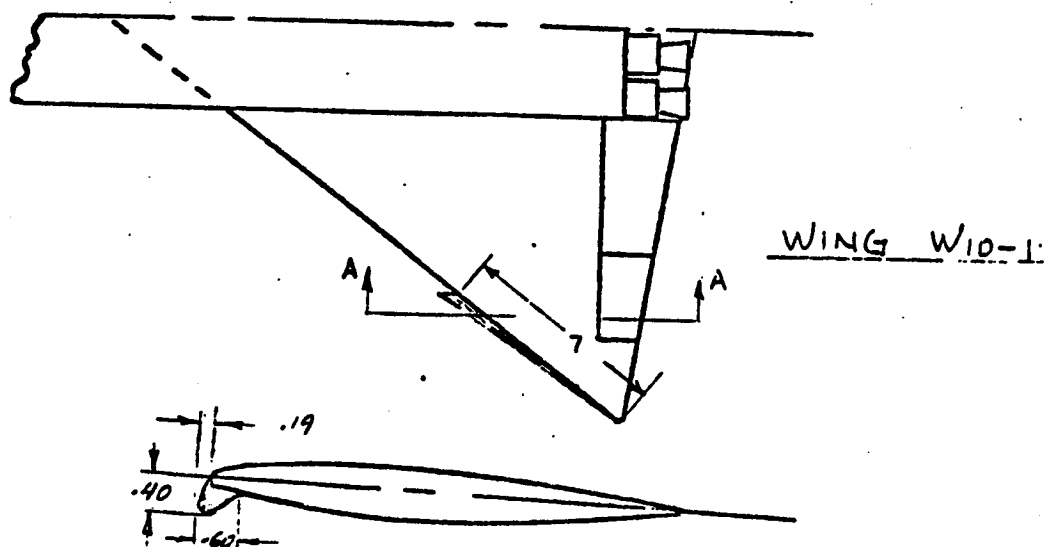


FIGURE 8. WINGS W10 AND W13



SECTION A-A

FIGURE 9. BASIC WING FOR THE B-15B CONFIGURATION.  
 $(L/D)_{MAX} = 5.29$



SECTION A-A

FIGURE 10. WING W10 MODIFIED WITH LEADING EDGE  
CAMBER ON OUTBOARD SECTION. SAME REF. CONDITIONS  
AS W10.  $(L/D)_{MAX} = 5.83$

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WING W10-2

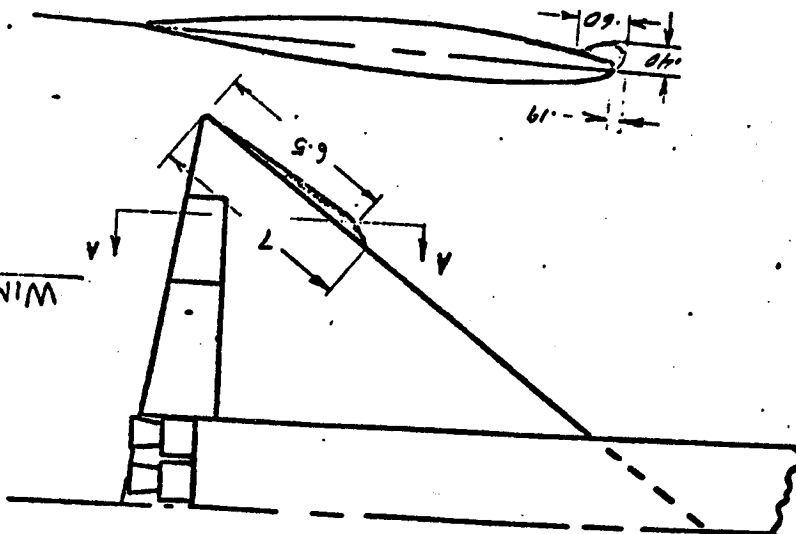
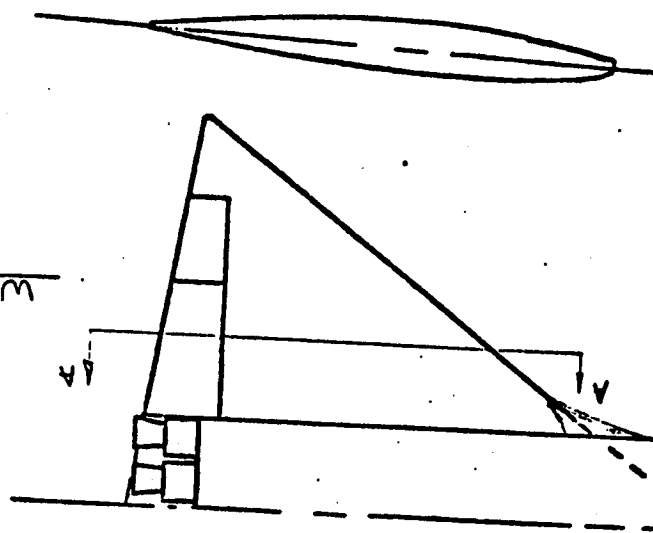
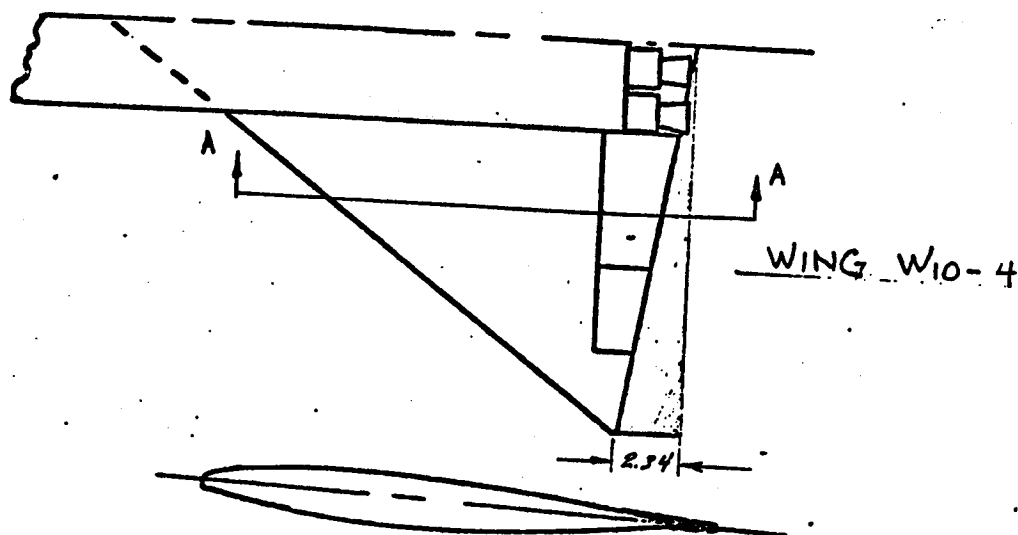


FIGURE 11. WING W10-1 MODIFIED BY FINING INBOARD  
L.E. CAMBER INTO WING, (L/D) MAX = 5.81

SECTION A-A

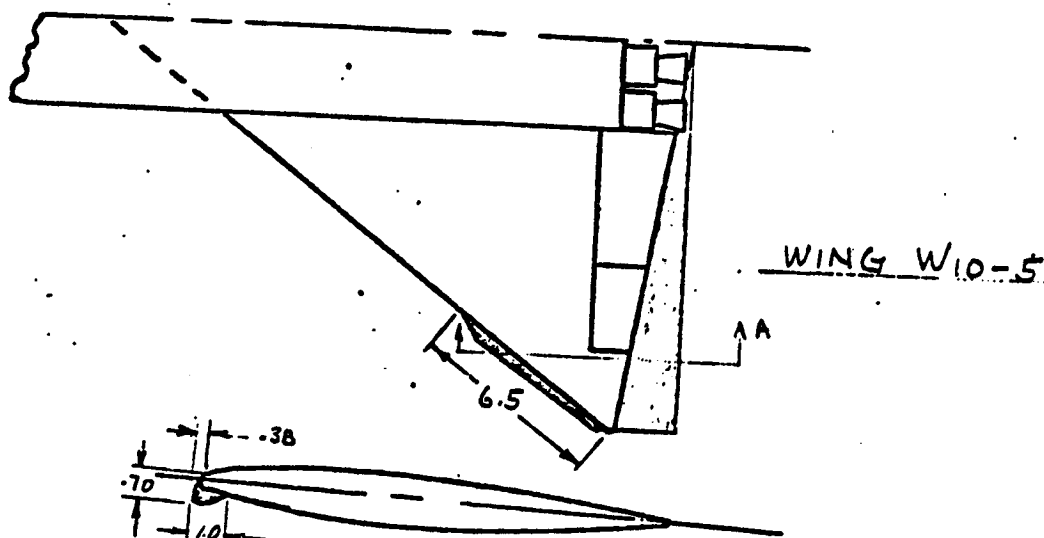
FIGURE 12. WING W10 WITH A SMALL WING-FUSELAGE  
FILLET, (L/D) MAX = 5.17





SECTION A-A

FIGURE 13. WING W10 WITH A T.E. EXTENSION MADE WITH SHEET OF 0.06 ALUM. AND WAX CONTOUR.  
 $(L/D)_{MAX} = 5.58$



SECTION A-A

FIGURE 14. WING W10-4 WITH L.E. CAMBER ON OUTBOARD SECTION.  $(L/D)_{MAX} = 5.98$



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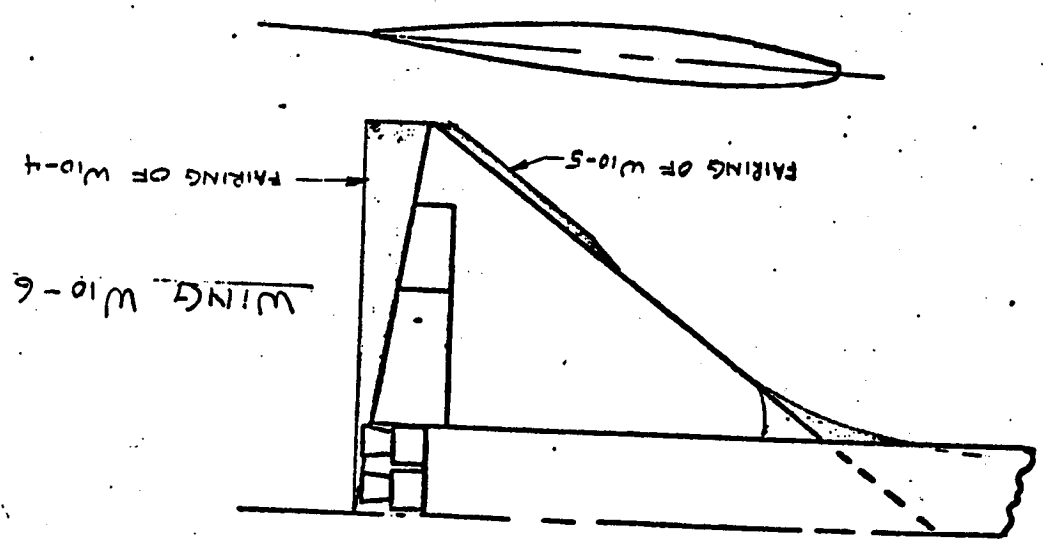


FIGURE 15. WING W10-5 WITH A WING-FUSELAGE FILLET.  
 SECTION A-A  
 $(L/D)_{MAX} = 5.95$

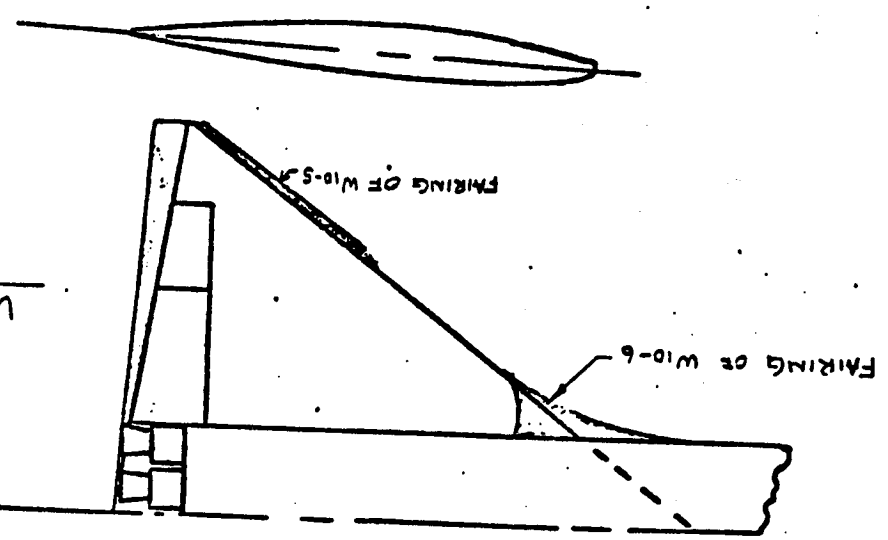


FIGURE 16. WING W10-6 WITH 1/2 OF THE T.E. EXTENSION.  
 SECTION A-A  
 $(L/D)_{MAX} = 5.87$

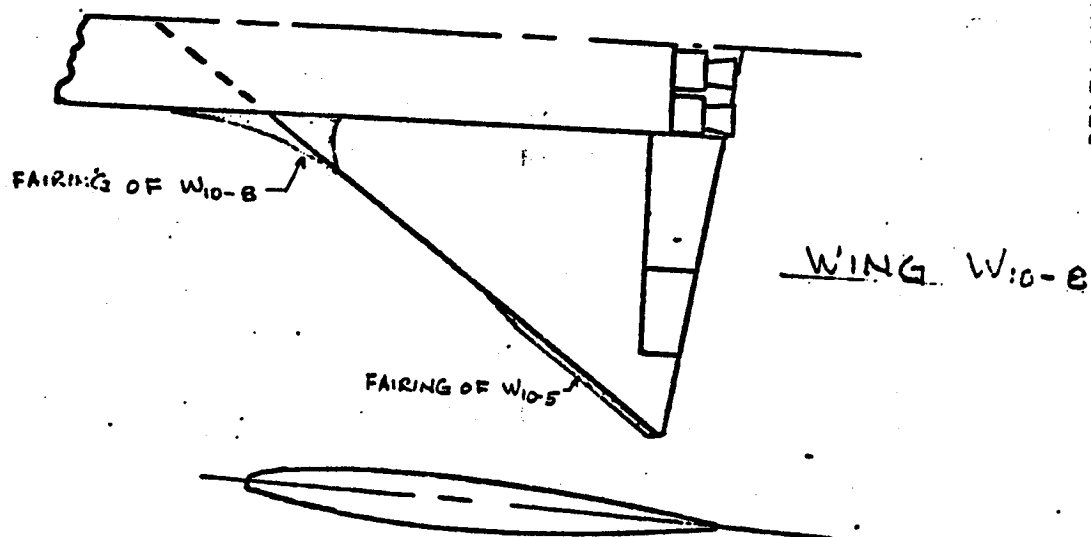


FIGURE 17. WING W10-6 WITHOUT T.E. EXTENSION.  
(L/D)<sub>MAX</sub> = 5.62.

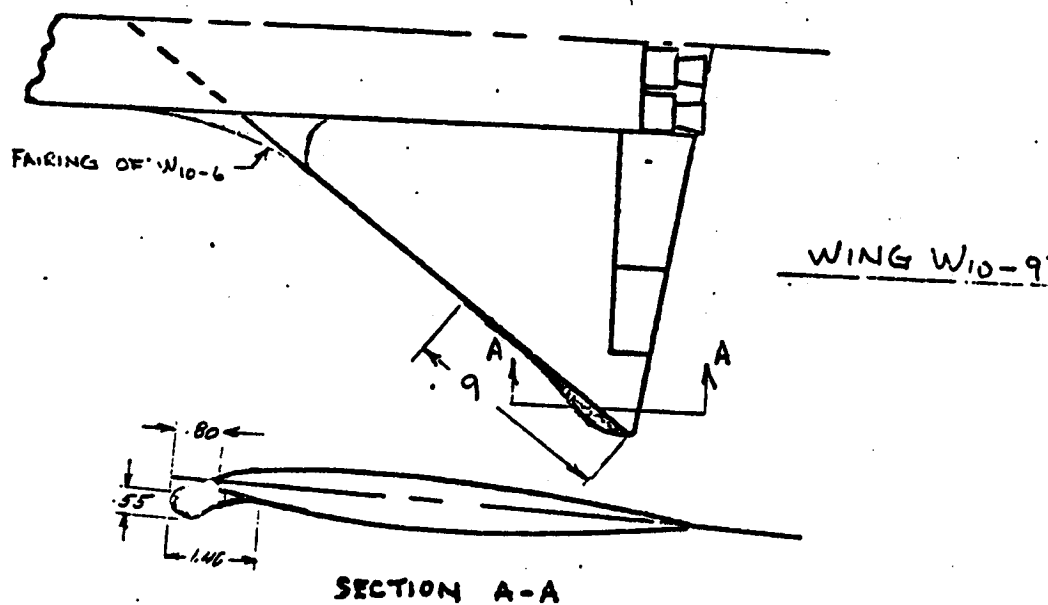
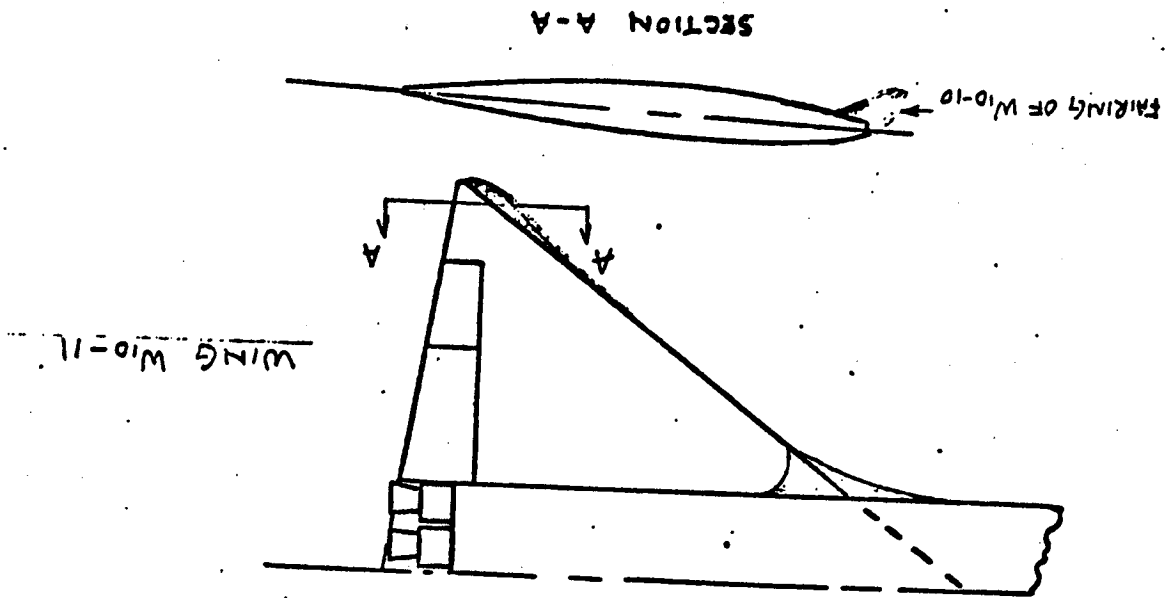
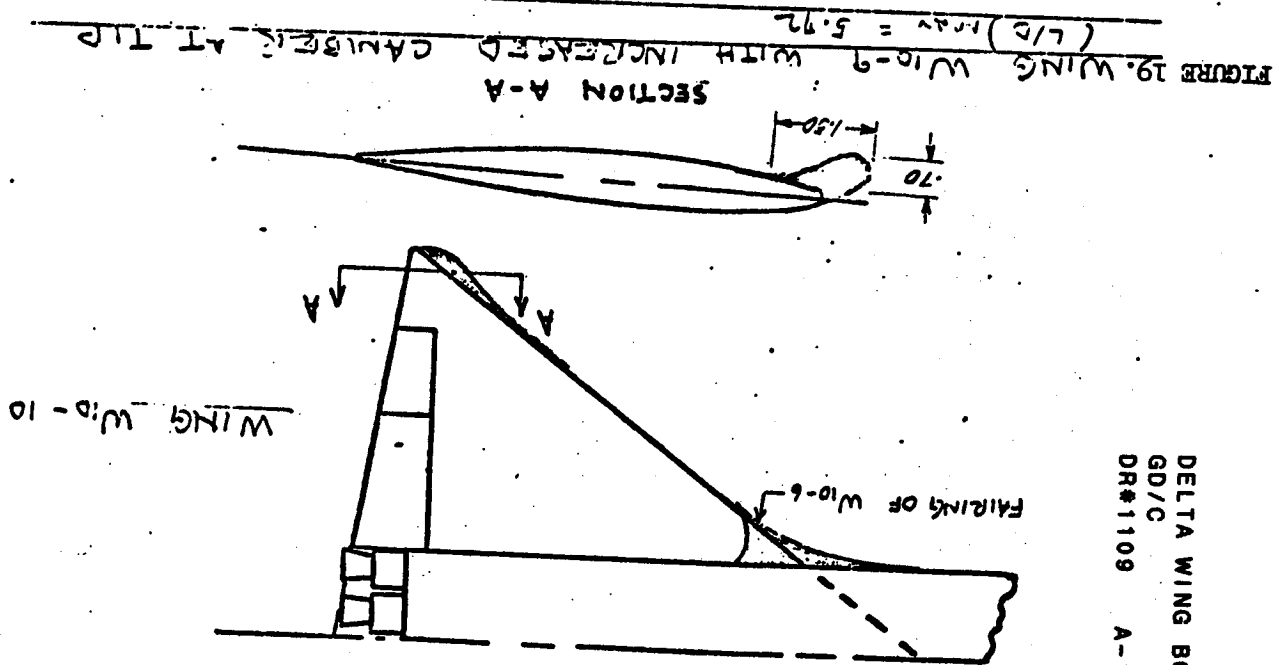
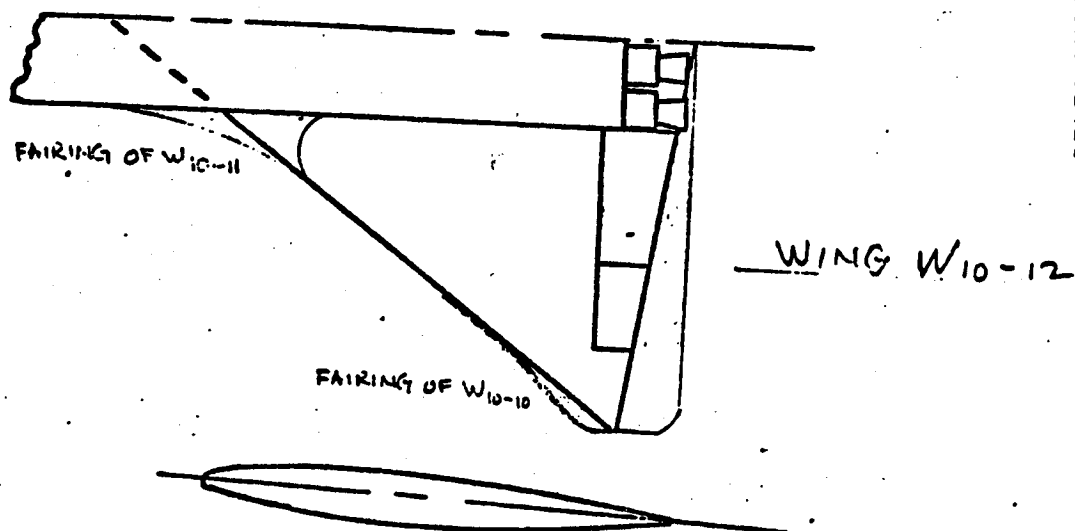


FIGURE 18. WING W10-8 WITH L.E. CAMBER REPLACED BY  
A CONCORD TYPE WING TIP. (L/D)<sub>MAX</sub> = 5.72

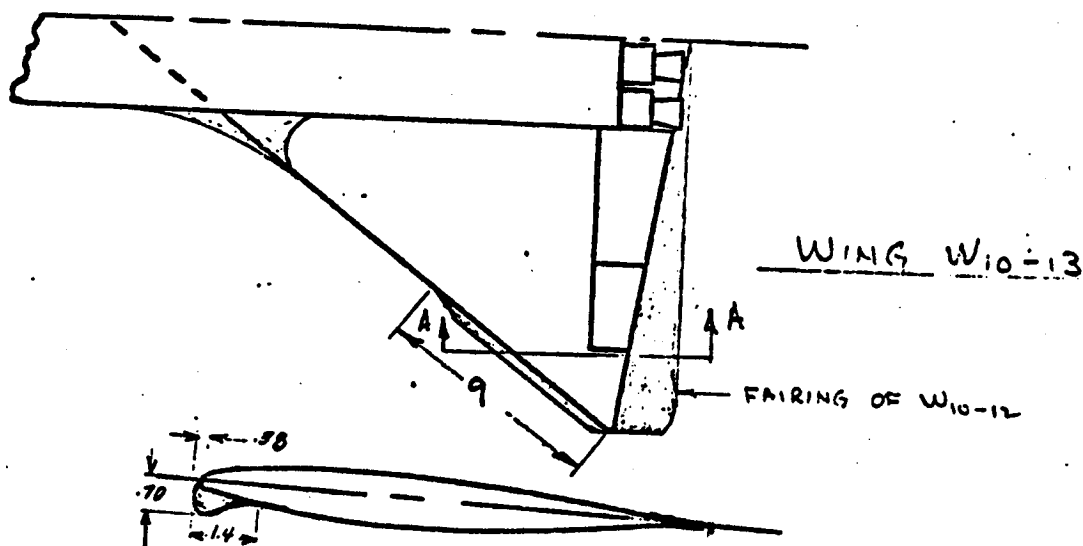
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SECTION A-A

FIGURE 21. WING W10-11 WITH FULL T.E. EXTENSION AND CURVED EDGES.  $(L/D)_{MAX} = 5.79$



SECTION A-A

FIGURE 22. WING W10-12 WITH CONCORD TIP REPLACED BY L.E. CAMBER.  $(L/D)_{MAX} = 6.02$

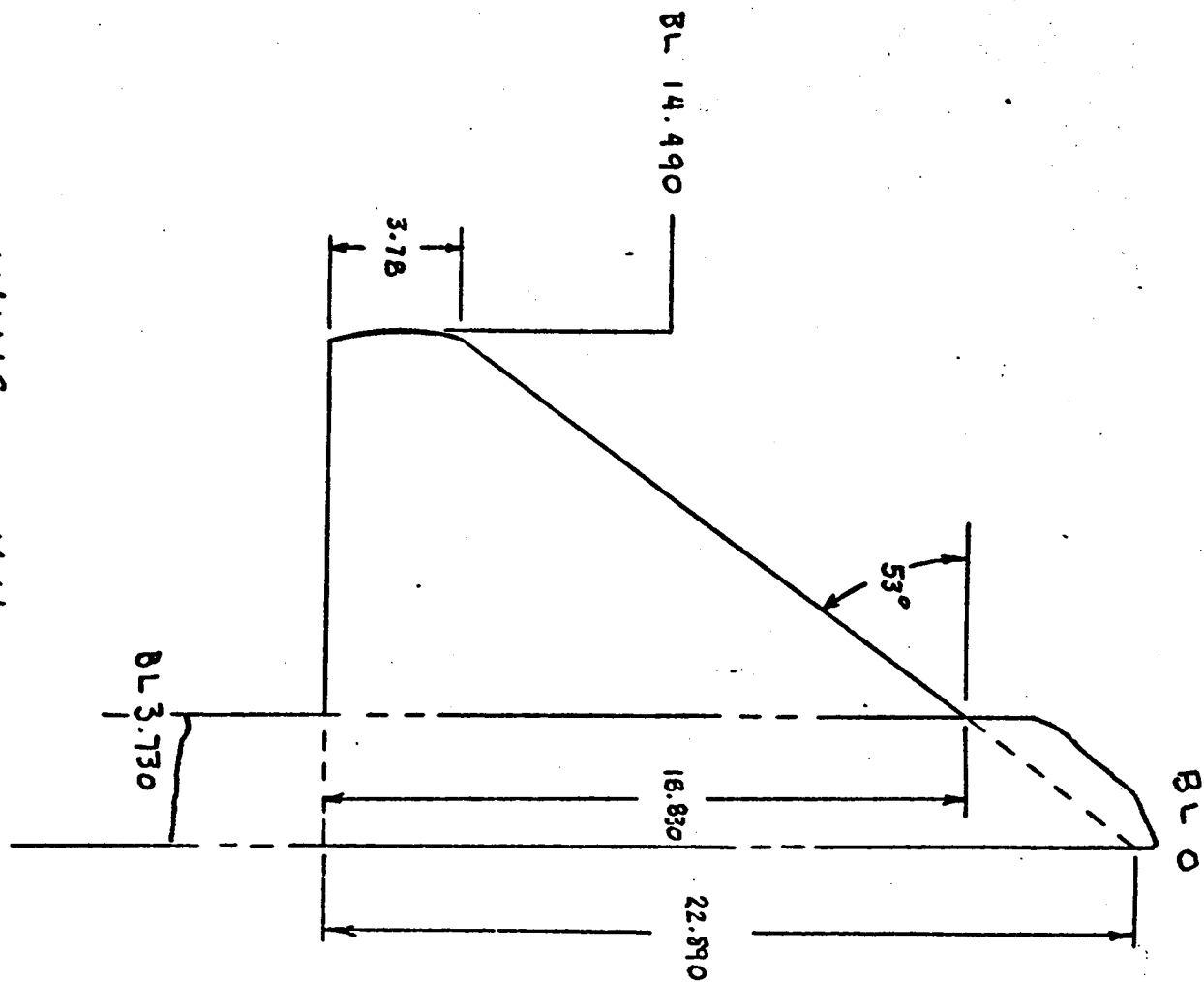


FIGURE 23. WING W11

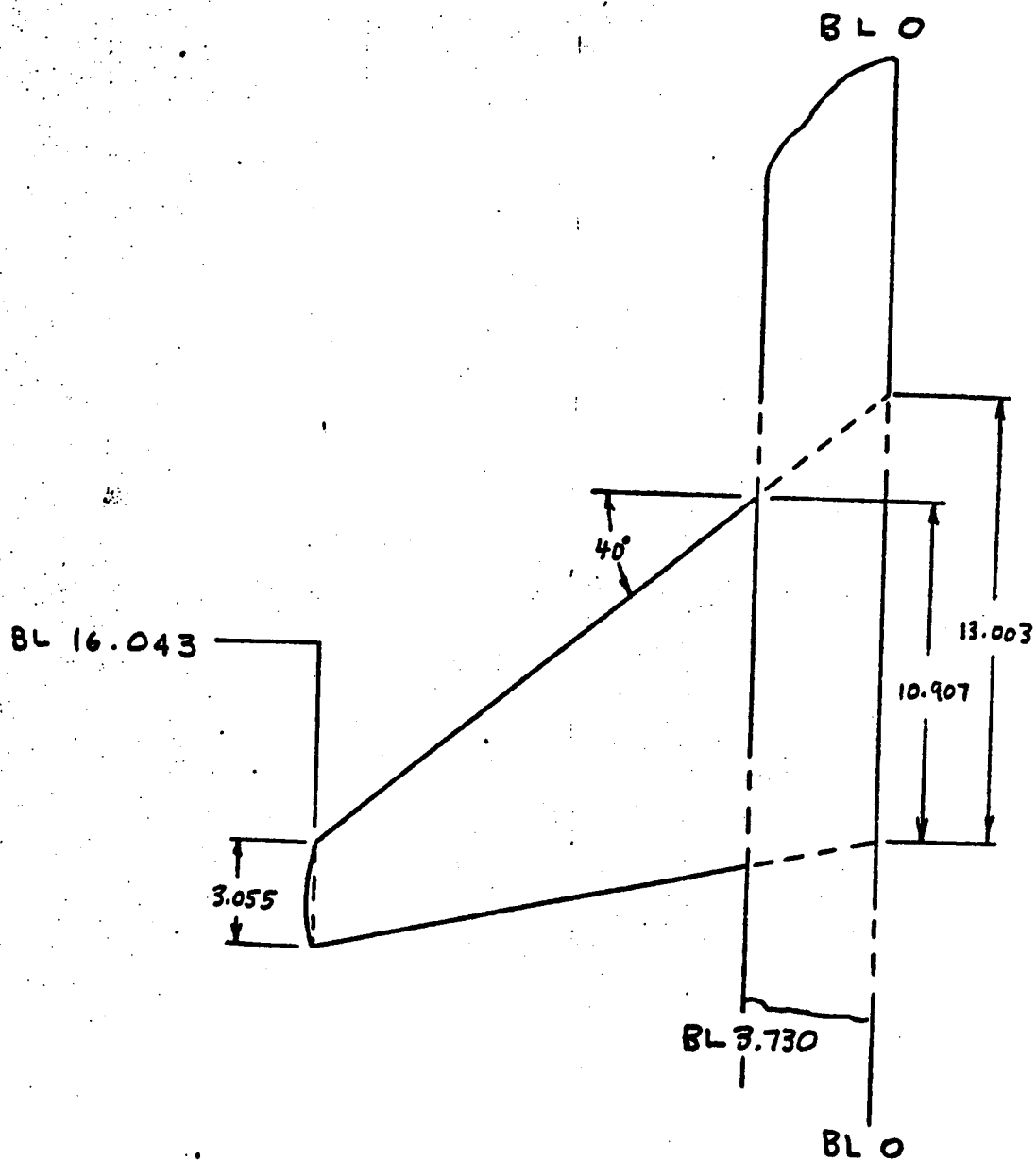


FIGURE 24. WING W12

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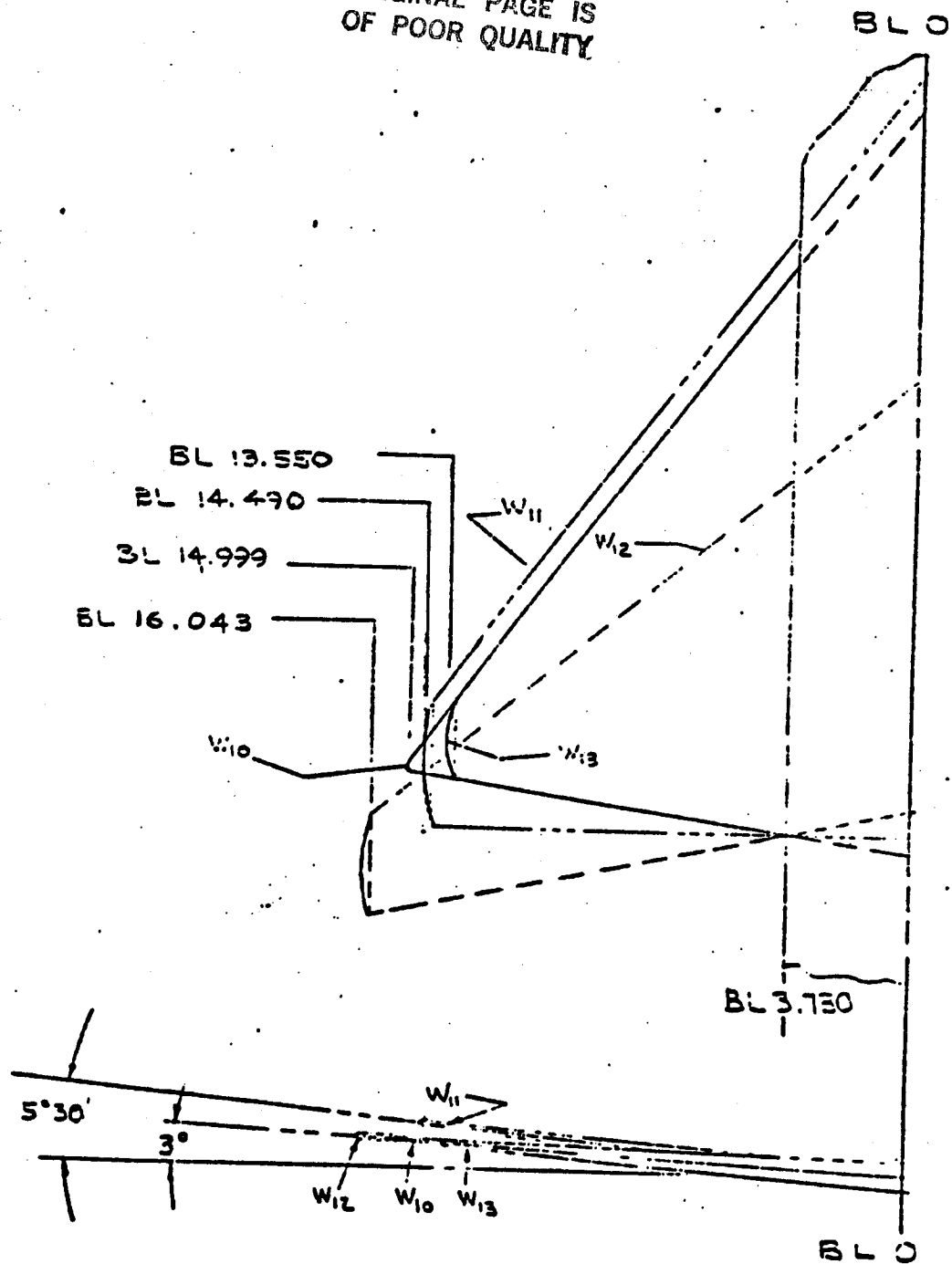


FIGURE 25. WING COMPARISONS

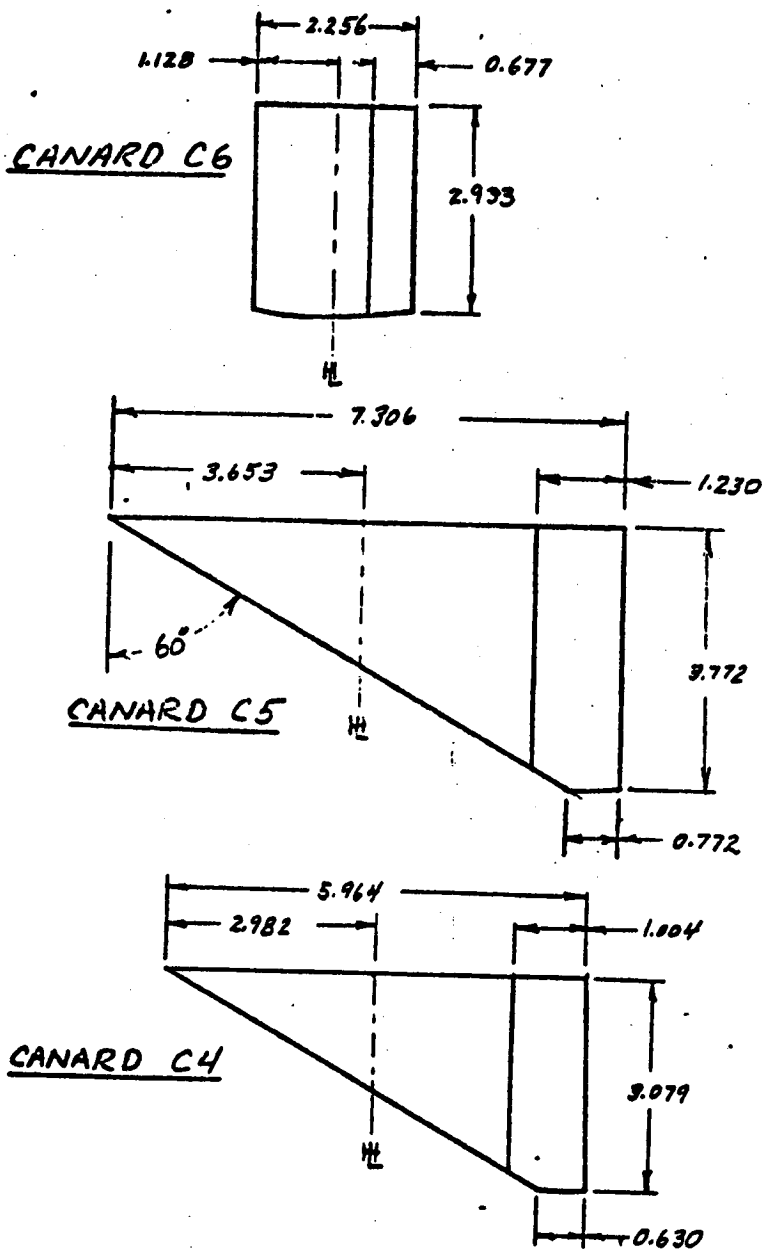
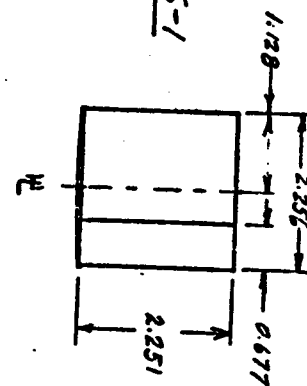


FIGURE 26.



CANARD C6-1



CANARD C7

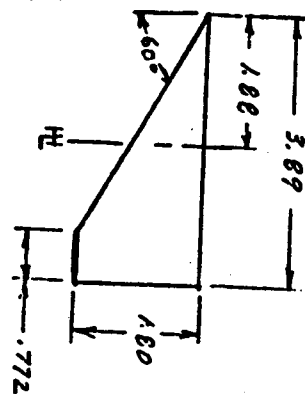


FIGURE 27.

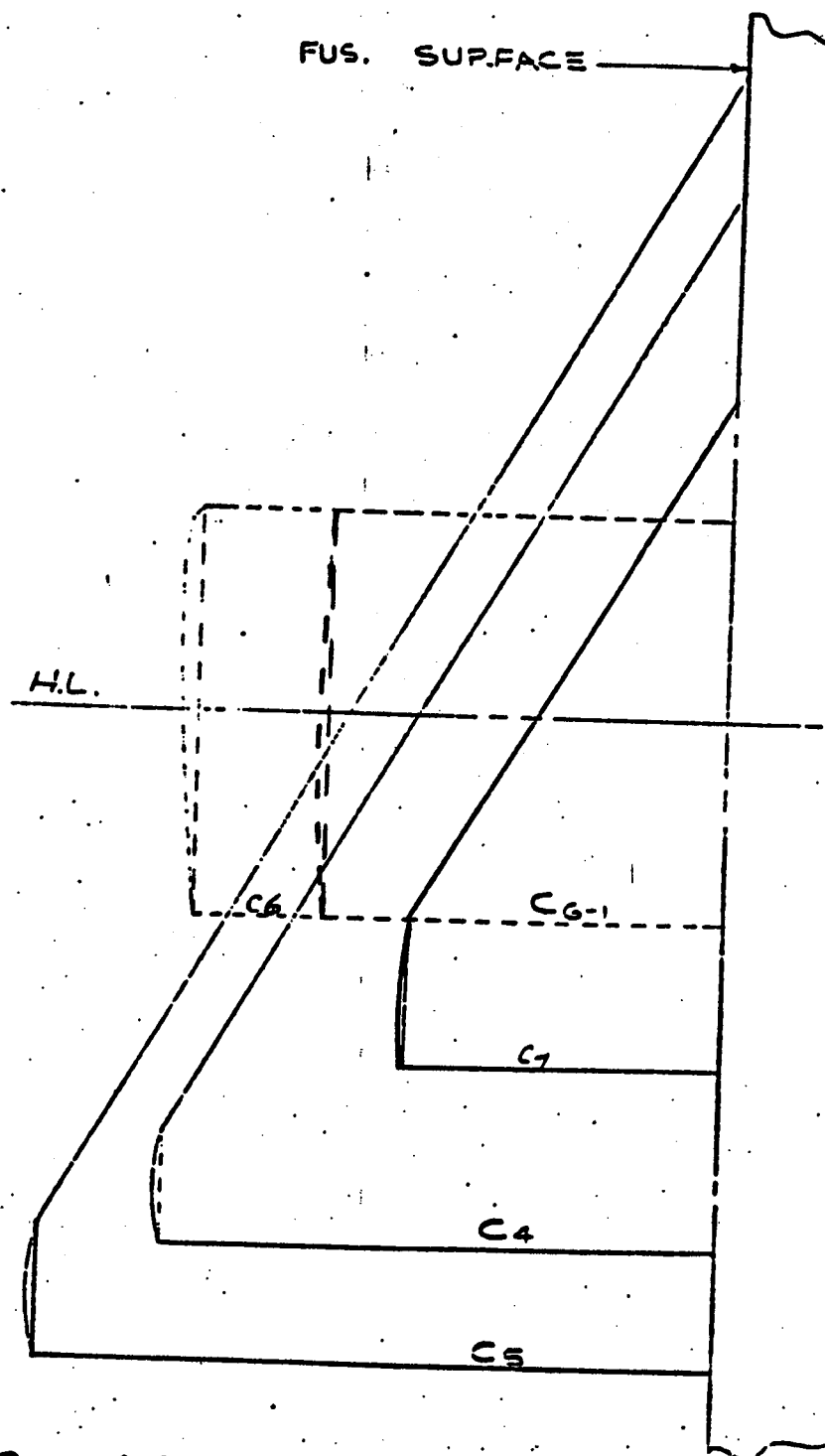


FIGURE 28. CANARD COMPARISON

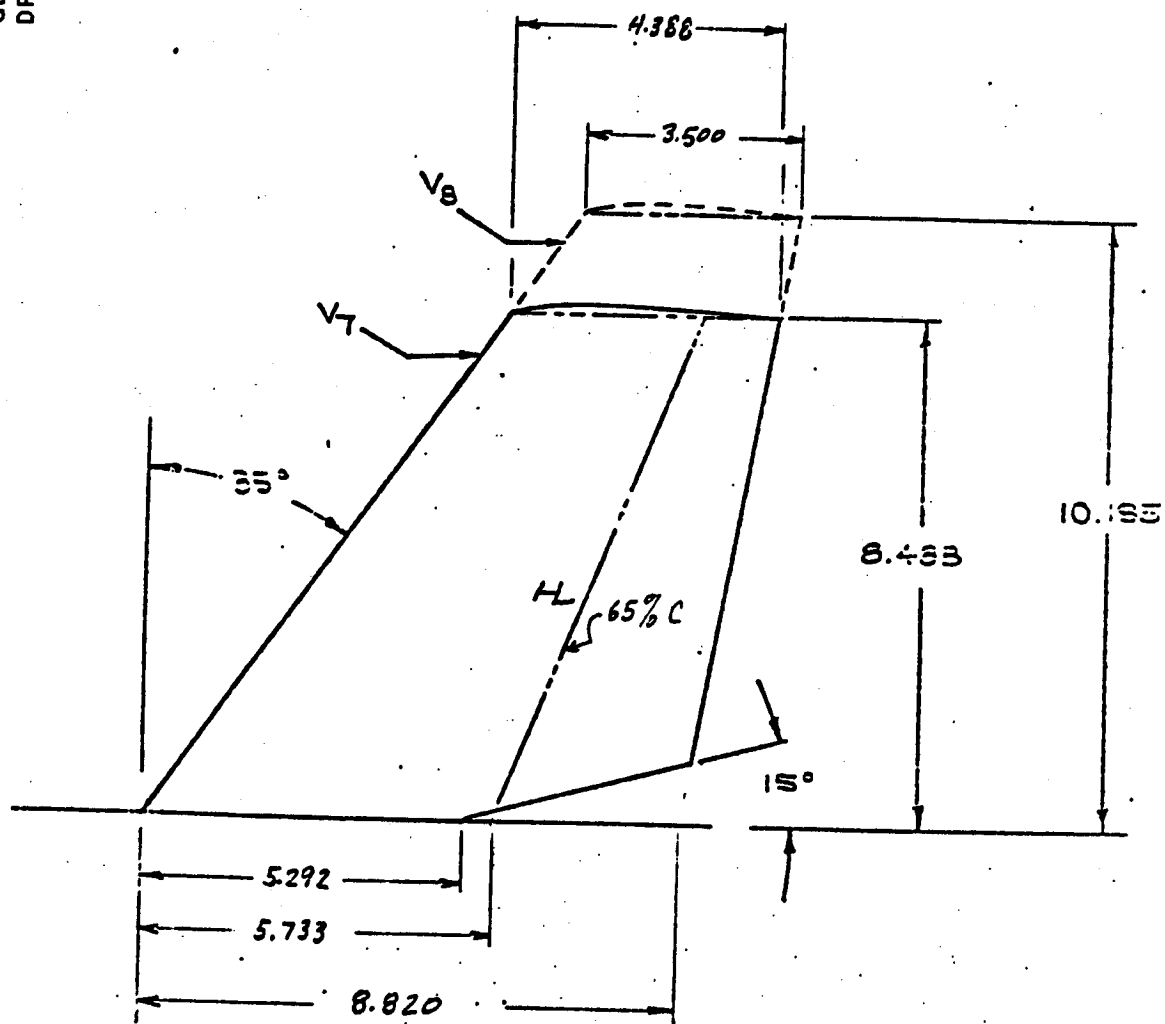
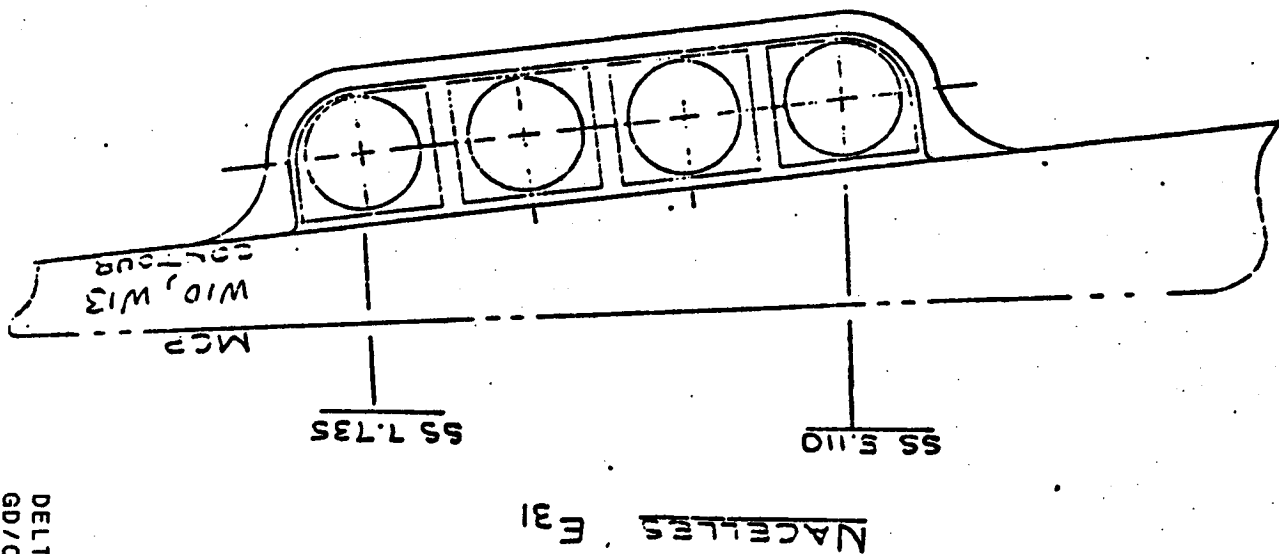
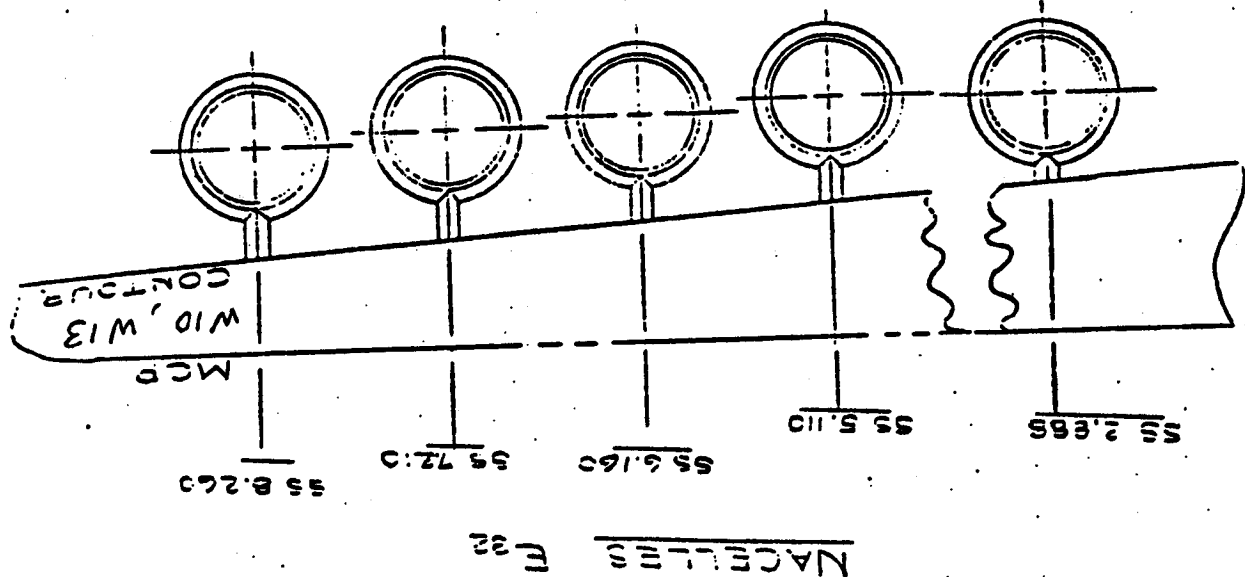


FIGURE 29. VERTICAL TAILS V7 AND V8



NACELLES E 31

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NACELLES E 32

DELTA WING BOOSTER  
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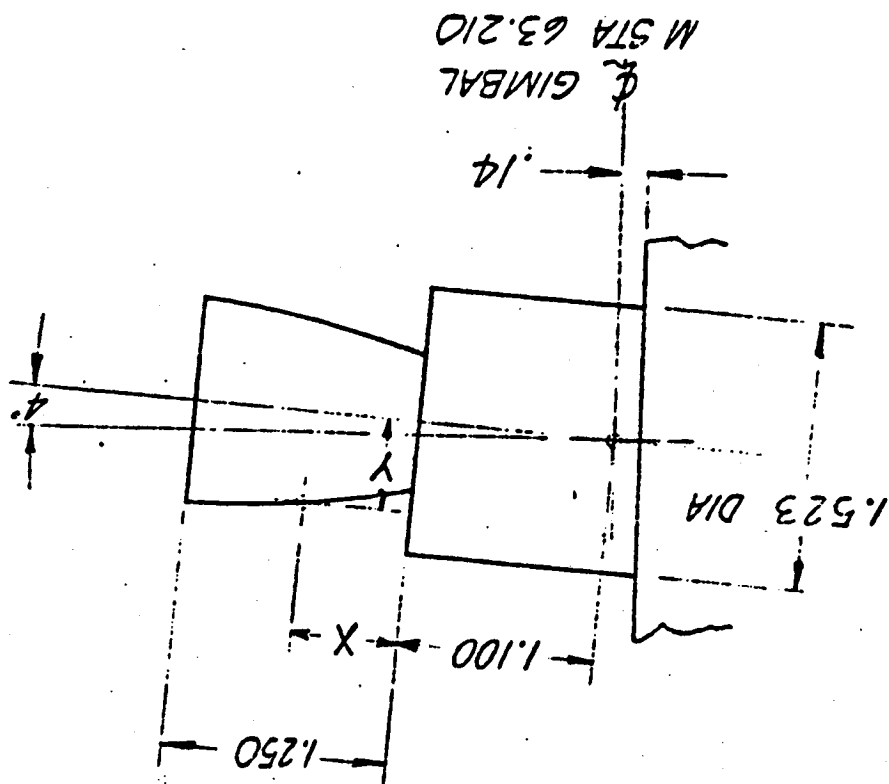


FIGURE 31. ROCKET ENGINE . R1

X	1.000	.38
Y	.200	.44
	.400	.48
	.600	.51
	.800	.55
	1.000	.57
	1.200	.57
	1.250	.58

ALPHA SWEEP IN FREE AIR

## POSTTEST

DATA SET IDENTIFIER		CONFIGURATION	SCHED.		CONTROL DEFLECTION				NO. of RUNS	BETA										POST TEST
			$\alpha$	$\chi$	$\delta_C$	$\delta_{CL}$	$\delta_R$	$\delta_{RL}$		0°	4°	5°	8°	10°						
RCV001		B <sub>19</sub> V <sub>7</sub> C <sub>4</sub> W <sub>10</sub>	A		%	%	%	0	3	1	2		3							
	002	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> W <sub>14</sub>							2	5		6								
	003	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> W <sub>15</sub>							2	8		9								
	004	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> W <sub>16</sub>							2	11		12								
	005	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> W <sub>18</sub>							2	14		15								
	006	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> W <sub>17</sub>							2	17		18								
	007	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub>							3	19		20		21						
	008	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub>							3	22		23		24						
	009	B <sub>21</sub> X <sub>1</sub>							3	25		26		27						
	010	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> E <sub>34</sub> W <sub>16</sub>			0%	0%	0%	0	3	28		29		30						
	011	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> E <sub>34</sub> W <sub>16</sub> L <sub>1</sub>							3	31		32		33						
	012	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> E <sub>34</sub> W <sub>16</sub> G <sub>2</sub>							3	34		35		36						
	013	B <sub>21</sub> X <sub>2</sub> V <sub>7</sub> C <sub>4</sub> E <sub>34</sub> W <sub>16</sub>							3	37		38		39						
	014	B <sub>21</sub> X <sub>3</sub> V <sub>7</sub> C <sub>4</sub> E <sub>34</sub> W <sub>16</sub>							3	40		41		42						
	015	B <sub>21</sub> V <sub>7</sub> C <sub>4</sub> E <sub>34</sub> W <sub>16</sub>							3	43		44		45						
	016	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> C <sub>4</sub> W <sub>16</sub>							3	46		47		48						
	017	B <sub>21</sub> X <sub>1</sub> V <sub>7</sub> W <sub>16</sub>							3	49		50		51						
	018	B <sub>21</sub> X <sub>1</sub> C <sub>4</sub> W <sub>16</sub>							3	52		53		54						
	019				3/3	3/3			3	55		56		57						
	020				1/10	1/10			3	58		59		60						

1	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71	75
CL	CY	CD	CSL	CLM	CLN	CAB	CA	WDCT	CT	BETA	ALPHA	10						
COEFFICIENTS:																		
a or b																		
SCHEDULES																		
$\gamma_A = -4$ to $+24$ $\gamma_B = 2$																		
DELTA WING BOOST																		

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TEST GDLST 567-1 DATA SET COLLATION SHEET

ALPHA SWEEP IN FREE AIR

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCED.		CONTROL DEFLECTION:				NO. OF RUNS	BETA									
		a	R	$\delta_c$	$\delta_{eL}$	$\delta_{eR}$	$\delta_R$		0°	4°	5°	8°	10°					
RCV 021	B <sub>21</sub> X <sub>1</sub> C <sub>4</sub> V <sub>7</sub> W <sub>16</sub>	A		0/0	-10/10	-10/10	0	3	61		62		63					
022					0/0	0/0		3	64		65		66					
023					3/3	3/3		3	67		68		69					
024					6/6	6/6		3	70		71		72					
025					10/10	10/10		3	73		74		75					
026					5/5	0/0	0/0	2	102		103							
027					10/10			3	105		106		107					
028					15/15			3	111		112		113					
029					20/10			3	114		115		116					
030					-10/10			3	120		121		122					
031						-10/10	-10/10	1	123									
032					15/15	3/3	3/3	1	127									

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OF POOR QUALITY

1	7	13	19	25	31	37	43	49	55	61	67	73	79
CL	CY	CD	CSL	CLM	CLN	CAB	CA	UDDT	CT	BETA	FLI/IA	IC	

COEFFICIENTS: \_\_\_\_\_ IDPVAR(1) IDPVAR(2) NDV

a or b \_\_\_\_\_

SCHEDULES \_\_\_\_\_

TEST GDLST 587-1 DAT. SRT COLLATION SURET

ALPHA SWEEP IN FREE AIR

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCH.	CONTROL DEFLECTION	NO. OF RUNS	MACH NUMBERS
RCV041	B21X1C4V7W16	A	0%	1	76
042			0%	1	77
043			0%	1	78
044			0%	1	79
045			0%	1	80
046			0%	1	81
047			0%	1	82
048			0%	1	83
049			0%	1	84
050			0%	1	85
051			0%	5	95
52	B21X1V7W16		0%	1	96
53			0%	1	97
54			0%	1	98
55			0%	1	99
56			0%	1	00

COEFFICIENTS:	CL	CY	CZ	CLM	CLN	CH8	CA	CDOT	CT	MACH	ALPHA	IC
1	7	13	19	25	31	37	43	49	55	61	67	7576

or 8 SCHEDULES  
IDPVAR(1)|IDPVAR(2)|NDV

DELTA WING BOOSTER  
GD/C  
DR#1110 A-1-373

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TEST GDLST 587-1 DATA SET COLLATION SHEET

## FREE AIR BETA SWEEPS AT CONSTANT ALPHA

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CL	FY	CD	CSL	CLM	CLN	CAB	CA	JUDGT	CT	ALPHA	STG	

$$\rho = -6 \pm 114^\circ @ \Delta \rho = 2^\circ \rightarrow |IDPVAR(1)|IDPVAR(2)|NDV$$

# TEST GDLST 587-1 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

MODEL IN GROUND PLANE

ELEVATION

DATA SET IDENTIFIER	CONFIGURATION	SCHEM.	CONTROL DEFLECTION	NO. OF RUNS	ELEVATION
G02	B2X1Y7W1G3	0/0	1	1	139
G03	B2X1Y7W1G3	5/5	1	1	140
G04	B2X1Y7W1G3	20/20	1	1	141
G05	B2X1Y7W1G3	15/15	2	1	142
G06	B2X1Y7W1G3	-	4	1	143
G07	B2X1Y7W1G3	15/15	1	1	144
G08	B2X1Y7W1G3	10/10	5	1	145
G09	B2X1Y7W1G3	0/0	1	1	146
G10	B2X1Y7W1G3	10/10	1	1	147
G11	B2X1Y7W1G3	10/10	1	1	148
G12	B2X1Y7W1G3	10/10	1	1	149
G13	B2X1Y7W1G3	10/10	1	1	150
G14	B2X1Y7W1G3	10/10	1	1	151
G15	B2X1Y7W1G3	10/10	1	1	152
G16	B2X1Y7W1G3	10/10	1	1	153
G17	B2X1Y7W1G3	10/10	1	1	154
G18	B2X1Y7W1G3	10/10	1	1	155
G19	B2X1Y7W1G3	10/10	1	1	156
G20	B2X1Y7W1G3	10/10	1	1	157
G21	B2X1Y7W1G3	10/10	1	1	158
G22	B2X1Y7W1G3	10/10	1	1	159
G23	B2X1Y7W1G3	10/10	1	1	160
G24	B2X1Y7W1G3	10/10	1	1	161
G25	B2X1Y7W1G3	10/10	1	1	162
G26	B2X1Y7W1G3	10/10	1	1	163
G27	B2X1Y7W1G3	10/10	1	1	164
G28	B2X1Y7W1G3	10/10	1	1	165
G29	B2X1Y7W1G3	10/10	1	1	166
G30	B2X1Y7W1G3	10/10	1	1	167
G31	B2X1Y7W1G3	10/10	1	1	168
G32	B2X1Y7W1G3	10/10	1	1	169
G33	B2X1Y7W1G3	10/10	1	1	170
G34	B2X1Y7W1G3	10/10	1	1	171
G35	B2X1Y7W1G3	10/10	1	1	172
G36	B2X1Y7W1G3	10/10	1	1	173
G37	B2X1Y7W1G3	10/10	1	1	174
G38	B2X1Y7W1G3	10/10	1	1	175
G39	B2X1Y7W1G3	10/10	1	1	176
G40	B2X1Y7W1G3	10/10	1	1	177
G41	B2X1Y7W1G3	10/10	1	1	178
G42	B2X1Y7W1G3	10/10	1	1	179
G43	B2X1Y7W1G3	10/10	1	1	180
G44	B2X1Y7W1G3	10/10	1	1	181
G45	B2X1Y7W1G3	10/10	1	1	182
G46	B2X1Y7W1G3	10/10	1	1	183
G47	B2X1Y7W1G3	10/10	1	1	184
G48	B2X1Y7W1G3	10/10	1	1	185
G49	B2X1Y7W1G3	10/10	1	1	186
G50	B2X1Y7W1G3	10/10	1	1	187
G51	B2X1Y7W1G3	10/10	1	1	188
G52	B2X1Y7W1G3	10/10	1	1	189
G53	B2X1Y7W1G3	10/10	1	1	190
G54	B2X1Y7W1G3	10/10	1	1	191
G55	B2X1Y7W1G3	10/10	1	1	192
G56	B2X1Y7W1G3	10/10	1	1	193
G57	B2X1Y7W1G3	10/10	1	1	194
G58	B2X1Y7W1G3	10/10	1	1	195
G59	B2X1Y7W1G3	10/10	1	1	196
G60	B2X1Y7W1G3	10/10	1	1	197
G61	B2X1Y7W1G3	10/10	1	1	198
G62	B2X1Y7W1G3	10/10	1	1	199
G63	B2X1Y7W1G3	10/10	1	1	200

CL	LY	FD	CSL	CLM	CLN	CAB	CA	WDET	CT	ELEVATION
1	7	13	19	25	31	37	43	49	55	61
7576										

COEFFICIENTS:  
 n or 8  
 SCHEDULES

# TEST GDLST 587-1 DATA SET COLLATION SHEET

DELTA WING BOOSTER  
GD/C  
DR#1110 A-1- 376

## FLOW SIMULATION IN GROUND PLANE

☐ PRETEST  
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		CONTROL DEFLECTION				NO. OF RUNS	FLOW							
		$\alpha$	$\beta$	$\delta_c$	$\delta_{cl}$	$\delta_{cr}$	$\delta_R$		0	.13	.21	.29	.43	.52	.62	
RCVGF1	B <sub>21</sub> X <sub>1</sub> V <sub>4</sub> G <sub>4</sub> W <sub>6</sub> G <sub>3</sub> E <sub>35</sub>	F	0°	0/0	0/0	0/0	0	3	157					158	159	
GF2				-10/10				3	160					161	162	
GF3				10/10	10/10	10/10		7	163	164	165	166	167	168	169	
GF4					-7/10	-17/10		3	170					171	172	
GF5					-20/20	-20/20		3	173					174	175	
GF6					0/0	0/0		3	176					177	178	
GF7				15/15	3/3	3/3		3	179					180	181	
GF8				20/10	10/10	10/10		3	182					183	184	
GF9					0/0	0/0		3	185					186	187	
GF0	B <sub>21</sub> X <sub>1</sub> V <sub>4</sub> W <sub>6</sub> G <sub>3</sub> E <sub>35</sub>			-	-20/20	-20/20		3	188					189	190	

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CL CY CD CSL CLM CLN CAB CA WDAT GT FLOW ALPHA 10

COEFFICIENTS:  $\alpha_F = -2$  to  $+16^\circ$  @  $\Delta\alpha = 2^\circ$  IDPVAR(1) IDPVAR(2) NDV

$\alpha$  or  $\beta$

SCHEDULES

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TEST GDLST 5B7-1 DATA SET COLLATION SHEET

## FLOW SIMULATION IN FREE AIR

**□ PRETEST**

## POSTTEST

[illegible]

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CL	CV	CD	CEL	CON	CUN	AB	BA	UBST	CT	FLW	ALPHA	EE	

**COEFFICIENTS:**

**a or  $\beta$**

## SCHEDULES

(7) STING EXPLOSION

DELTA WING BOOSTER

GD / C

DR# 1110      A-1- 377



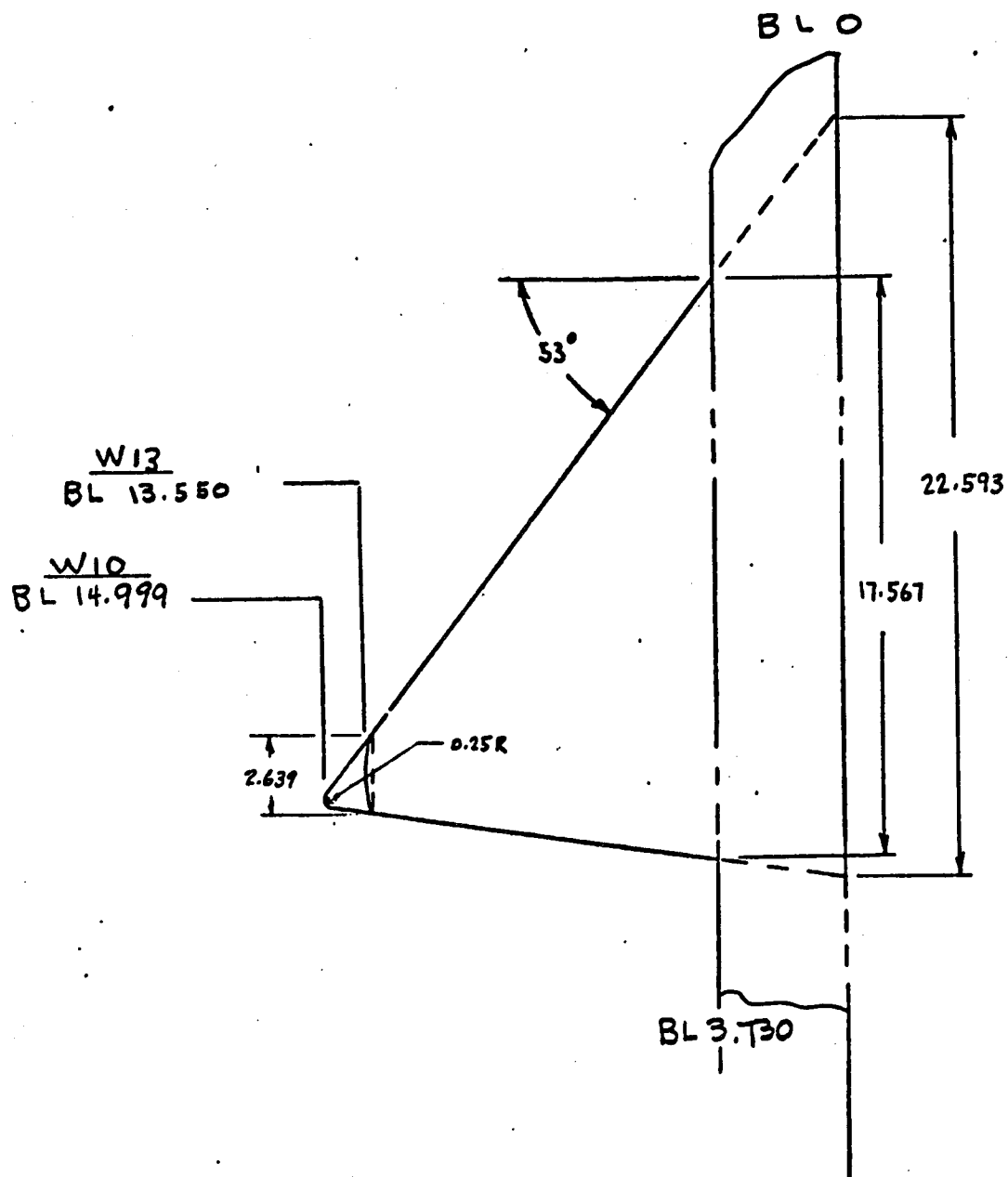


FIGURE 6. WINGS W10 AND W13

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QUALITY

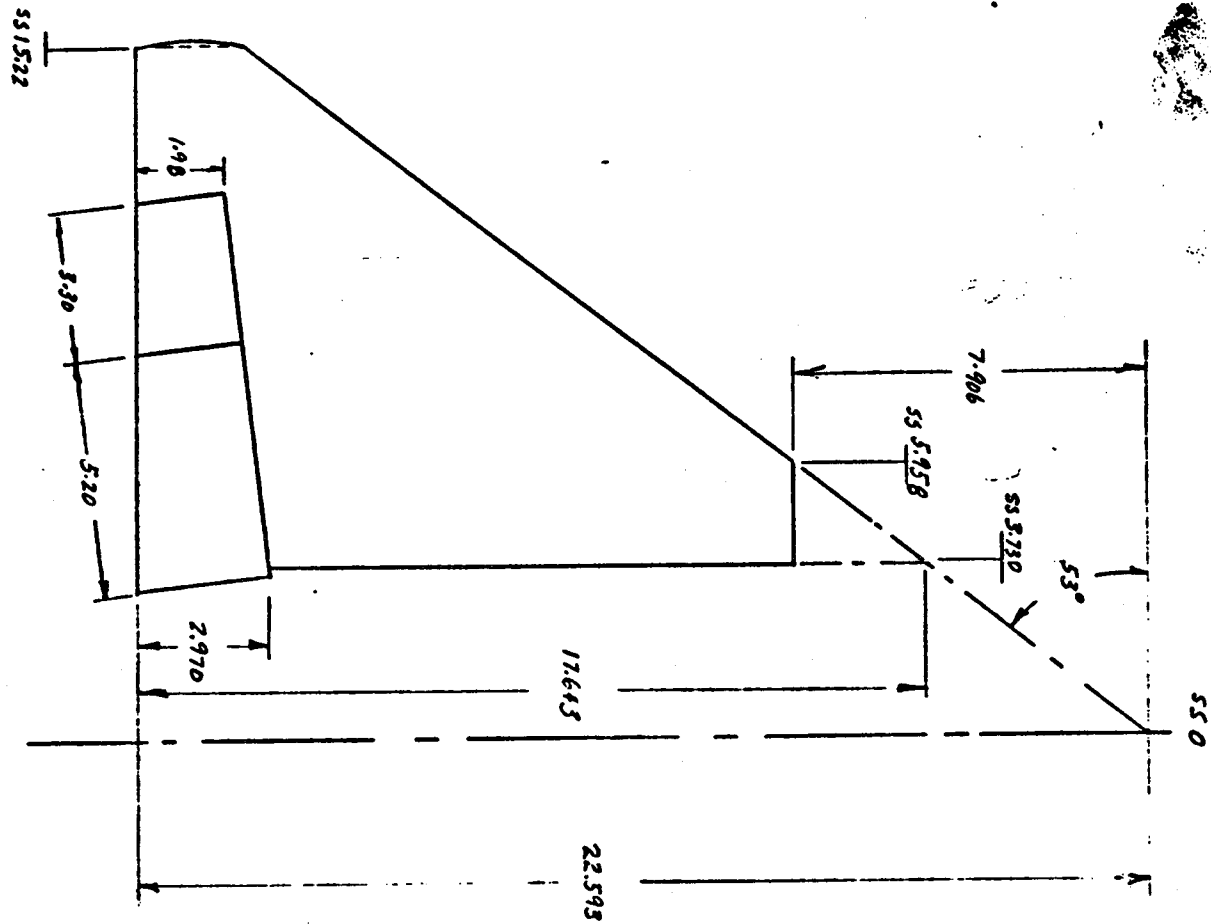
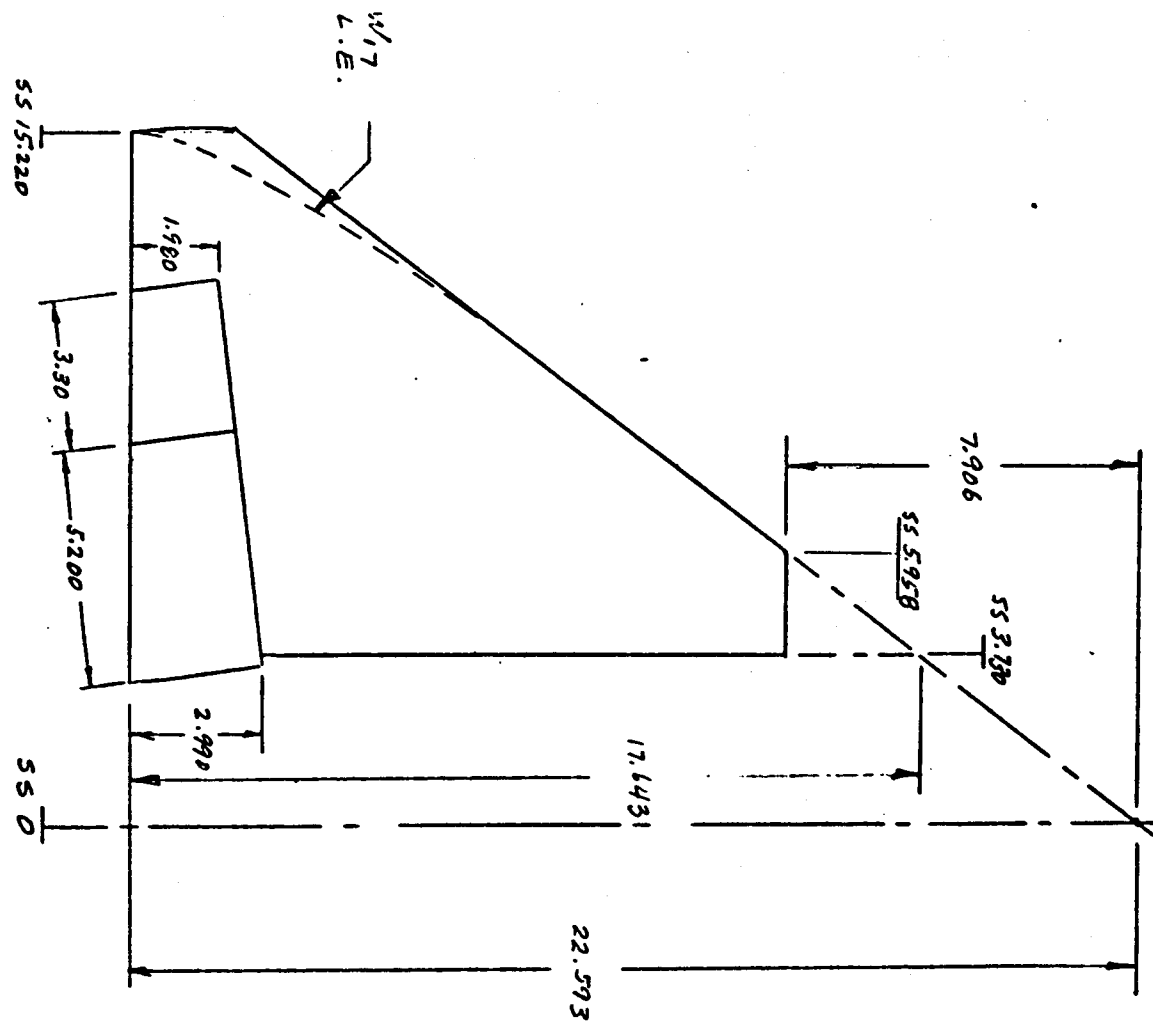


FIGURE 7. WING W/4

FIGURE 8. WINGS  $W_{15}$ ,  $W_{16}$ ,  $W_{17}$ ,  $W_{18}$



474

DELTA WING BOOSTER  
GD/C  
DR#1110 A-1- 381



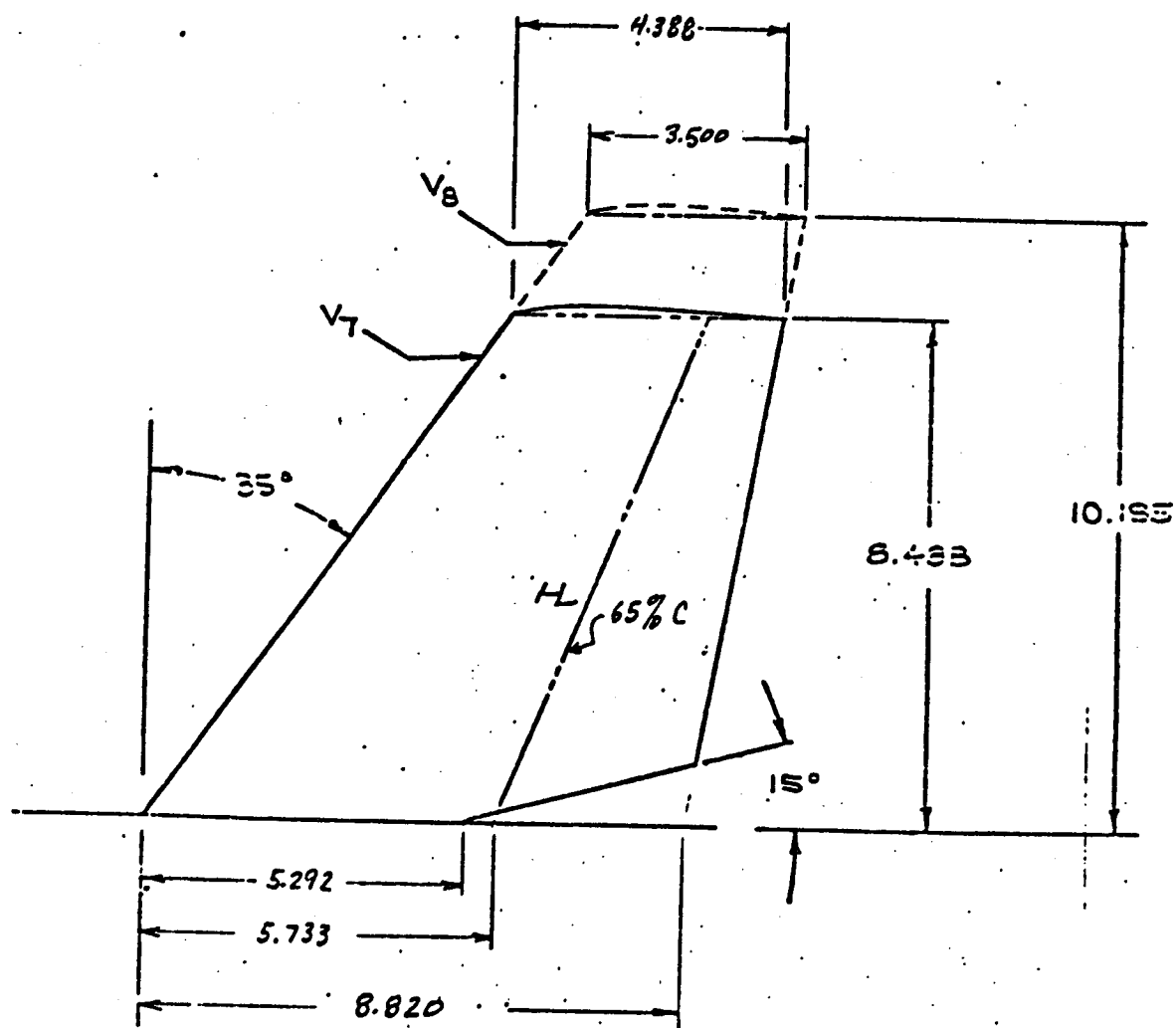
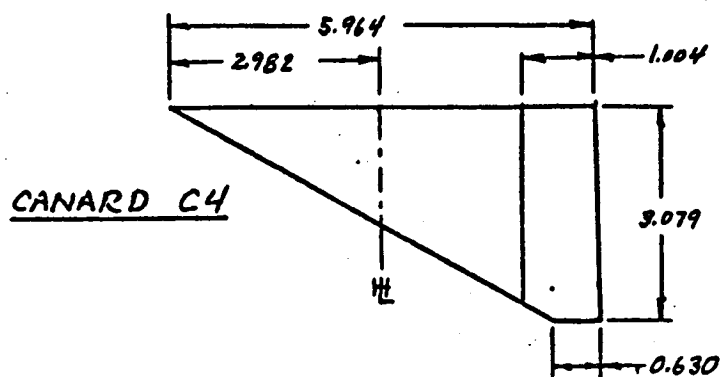


FIGURE 9. VERTICAL TAIL V.7



# NACELLES E<sub>34</sub>

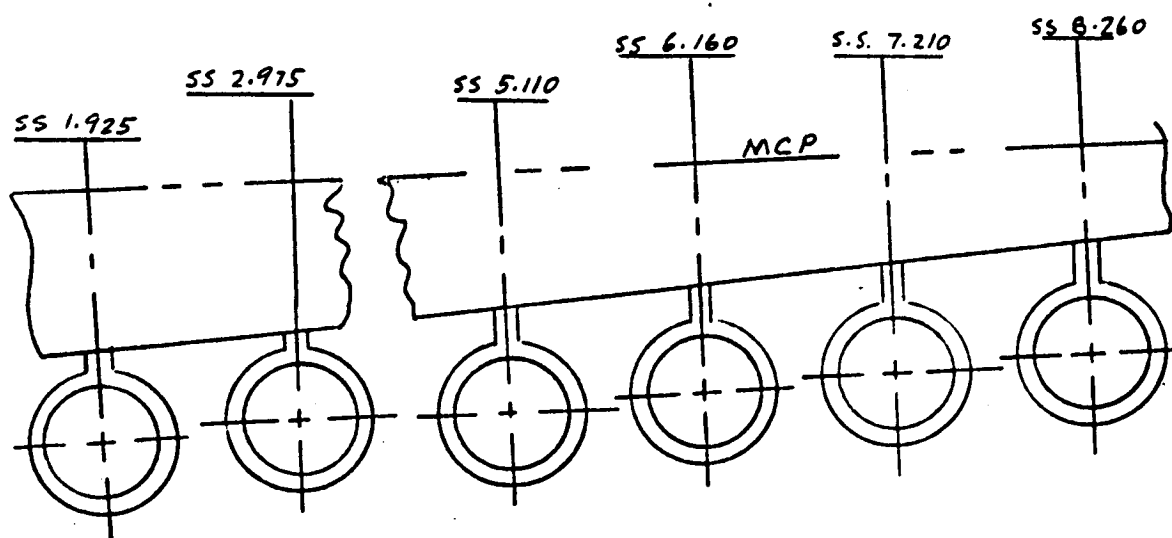
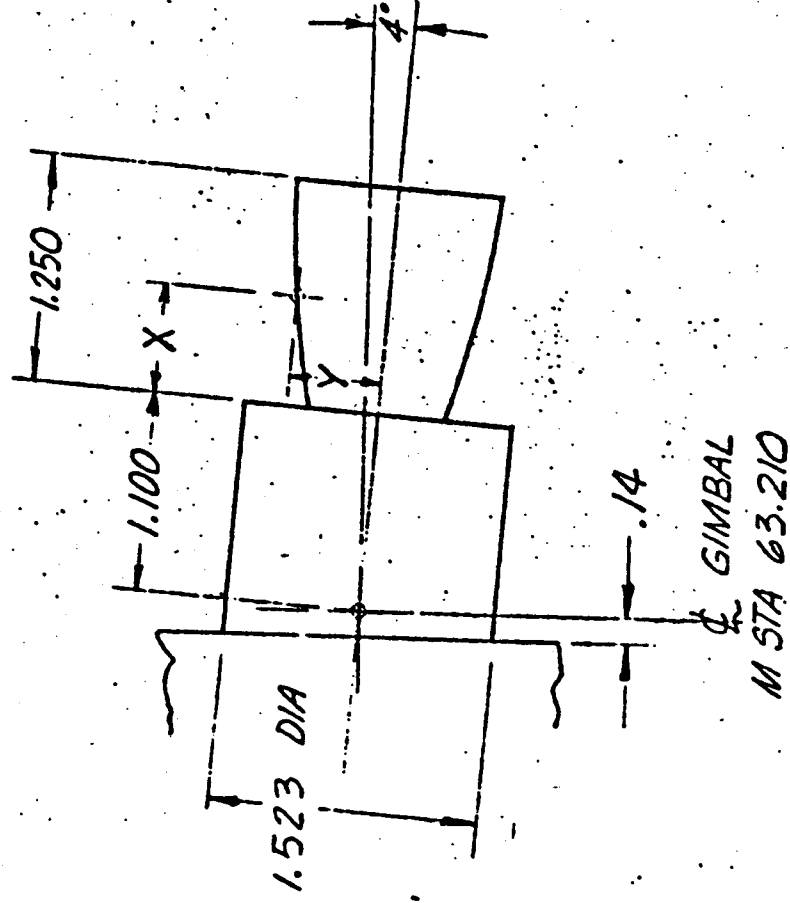


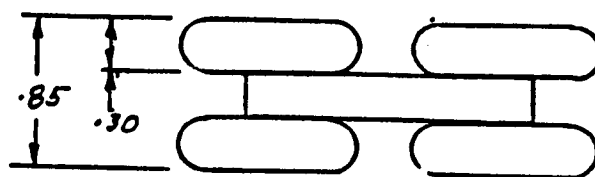
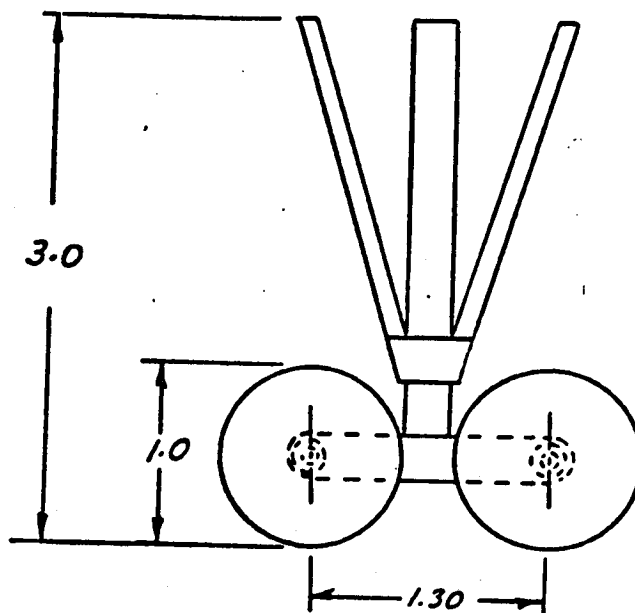
FIGURE 10. CANARD C4 AND NACELLES E<sub>34</sub>



X	Y
.000	.387
.200	.442
.400	.483
.600	.514
.800	.538
1.000	.560
1.200	.579
1.250	.583

FIGURE 11. ROCKETS  $R_1$

MAIN  
GEAR (2)



WHEEL DOOR

NOSE  
GEAR

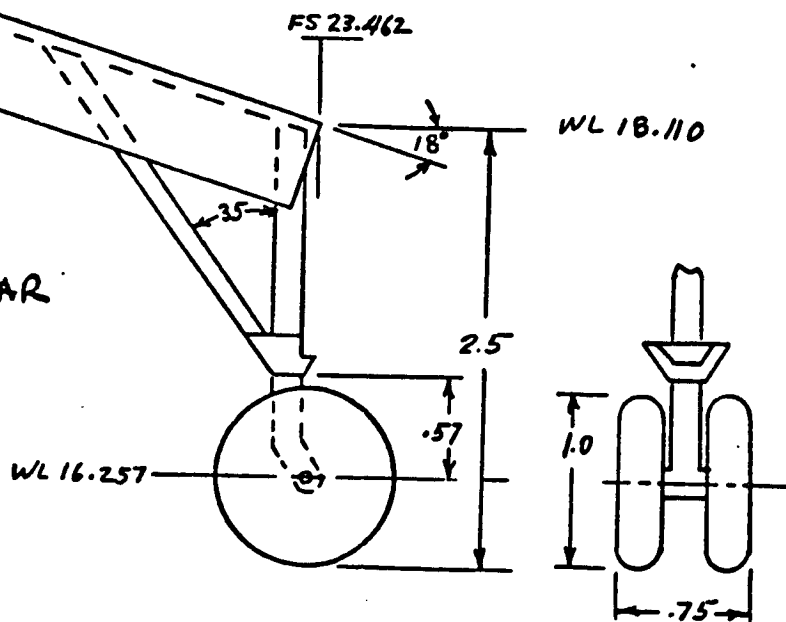


FIGURE 12. GEAR ~ G<sub>3</sub>

DELTA WING BOOSTER  
GD/C  
DR#1110 A-1- 386

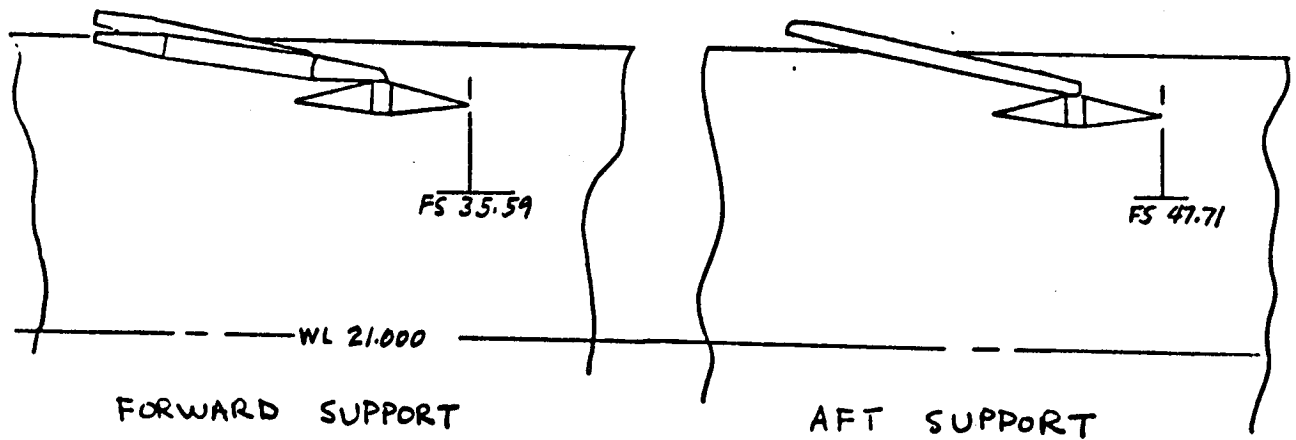
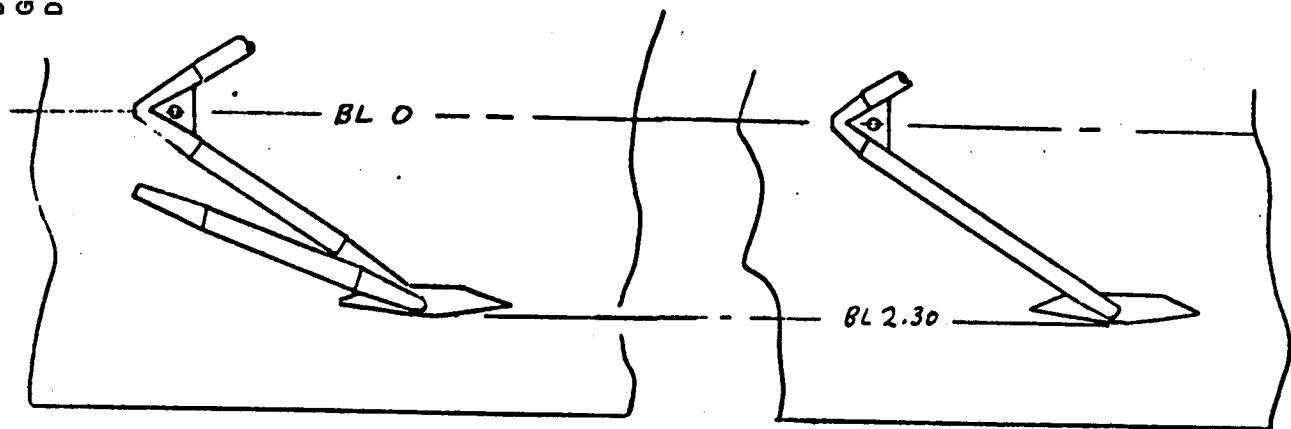


FIGURE 13.  $L_1$  ~ ORBITER ATTACHMENT STRUTS

DELTA WING BOOSTER  
GD/C  
DR#1110 A-1- 387

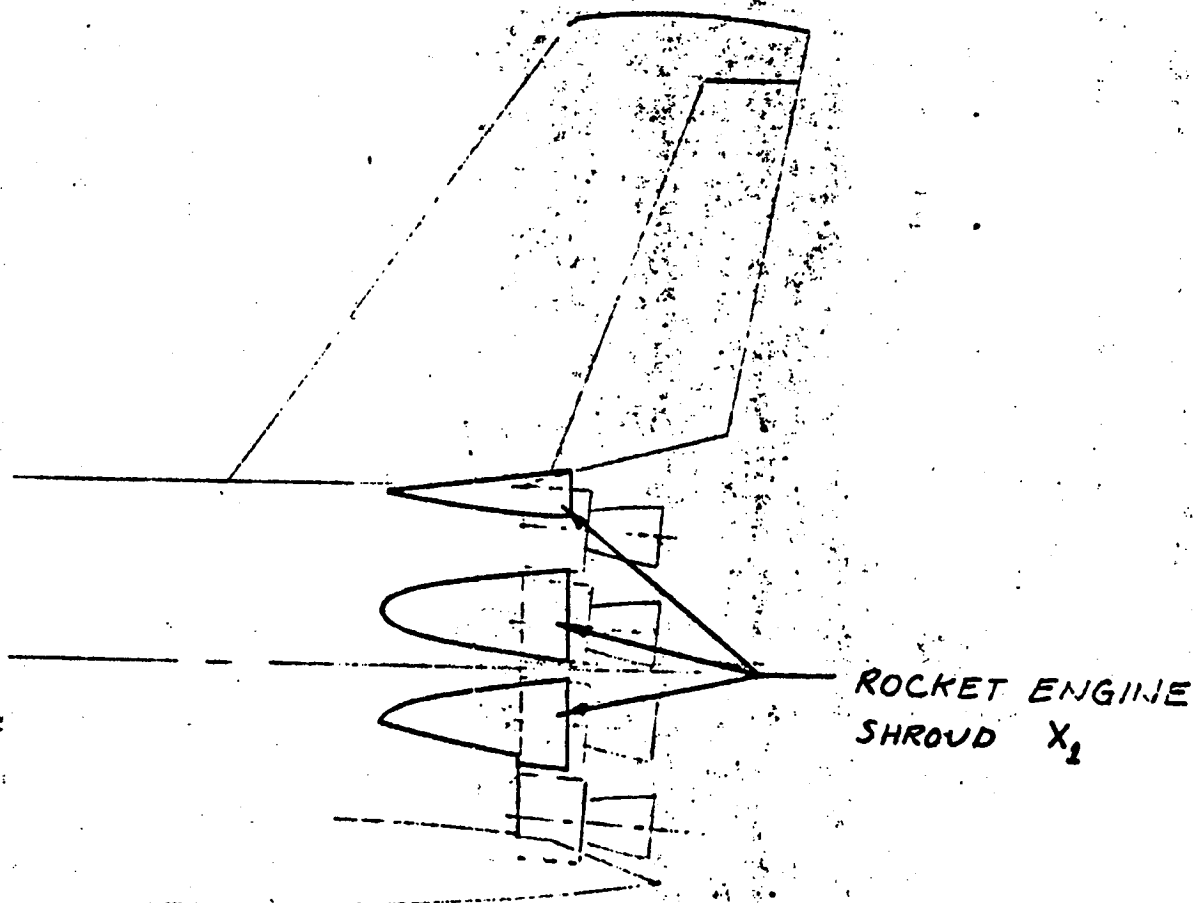


FIGURE 14. ROCKET ENGINE SHROUD X1

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ORIGINAL PAGE IS  
OF POOR QUALITY

ORIFICE NUMBER	LOCATION		ORIFICE NAME
	W.L.	B.L.	
1	22.894	1.894	BP 1
2	23.679	0.000	BP 2
3	20.940	2.678	BP 3
4	19.106	1.894	BP 4
5	18.322	0.000	BP 5
6	17.995	2.678	BP 6
7	20.940	1.785	BP 7

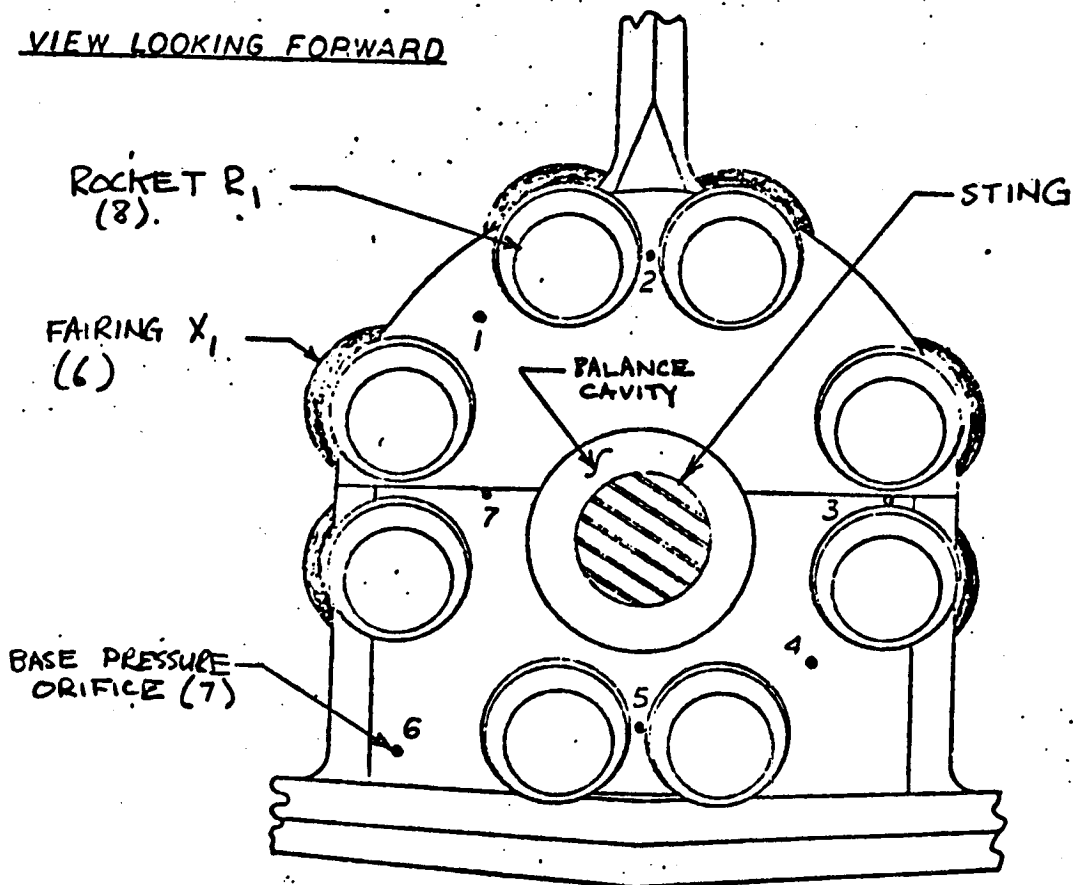


FIGURE 15. BASE REGION SHOWING COMPONENTS

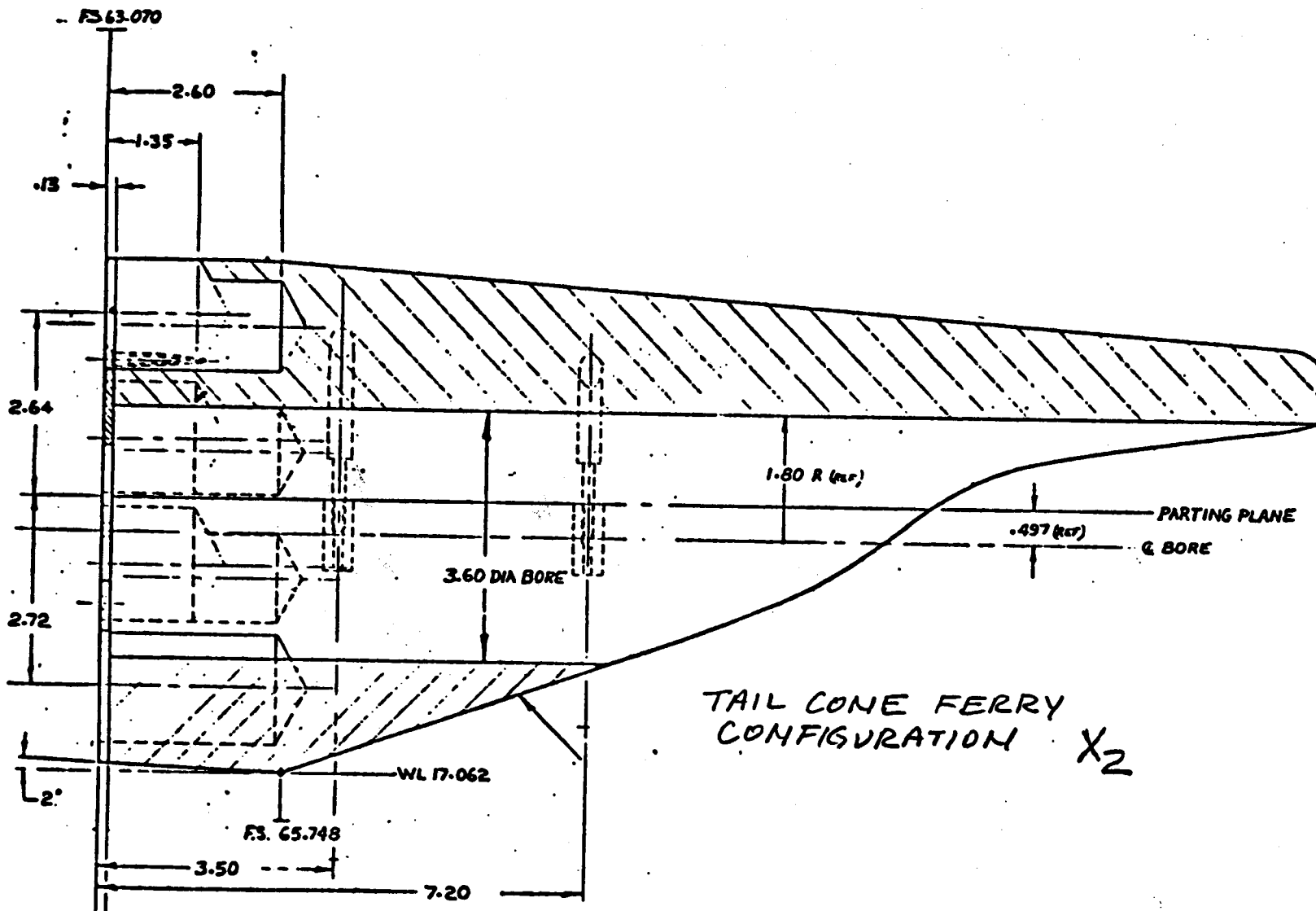


FIGURE 16. TAIL CONE FERRY CONFIGURATION X2

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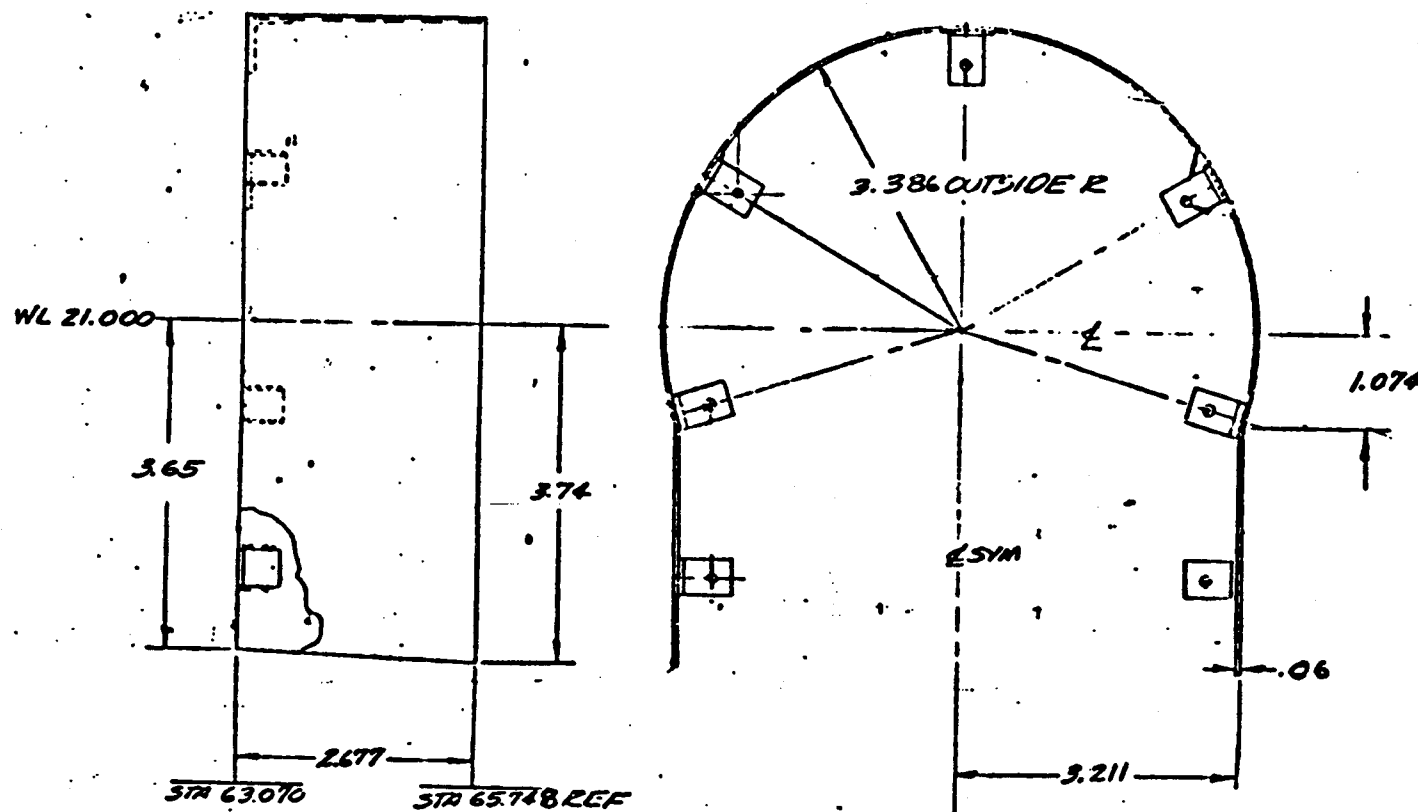


FIGURE 17. AFT SECTION SHROUD ~  $X_3$

TEST ARC G6-526 RUN SCHEDULE  
0.0076 SCALE SPACE SHUTTLE BOOSTER B-15B-1

PRE-TEST  
POST TEST

DATA SET IDENTIFIER	CONFIGURATION		SCHD.		CONTROL DEFLECTION								NO. OF RUNS	MACH NUMBER					PURPOSE	
			$\alpha$	$\beta$	CANARD		ELEVONS				RUDDER	RUN NUMBER					REMARKS			
							LEFT RIGHT													
					$I_L$	$I_R$	OUT	INS	OUT	INS		OUT		INS	OUT	INS	OUT	INS	OUT	INS
		ARO CODE																		
RAS150	B19C4W14V7	1	A	0	0	0	0	0	0	0	0	5	5	4	3	2	1	BASIC DATA		
240	B19C4W14	2	B		"						NA		10	9	8	7	6			
244					-30								25	24	23	22	21	CONTROL EFFECTS		
248					-45								60	59	58	57	56			
242					0		-10	-10	-10	-10			20	19	18	17	16			
249					"		10	10	10	10			65	64	63	62	61			
24J					-30		"	"	"	"			70	69	68	67	66			
247					0		10	0	-10	0			55	54	53	52	51	$\delta_e=0^\circ, \delta_a=10^\circ$		
246					$\delta_e=30^\circ, \delta_a=35^\circ$		0	0	0	0			15	14	13	12	11			
260	B20C4W14	3			0								30	29	28	27	26			
264		"			-30								35	34	33	32	31			
230	B19W14	4			NA	NA	0	0	0	0			40	39	38	37	36			
220	B19C4	5			0	0	NA	NA	NA	NA			45	43	42	41	44			
210	B19	6			NA	NA	NA	NA	NA	NA			50	49	48	47	46			
540	B19C4W14	2	28	C	0	0	0	0	0	0			80	79	78	77	76	ROLL LEFT DOWN		
640	"	"	53										85	84	83	82	81			
560	B20C4W14	3	28										75	74	73	72	71		85	

ALPHA RANGE: A -6°(4°)22° BETA SCHEDULE: C -6°-3°-1° 0° 1° 3° 6° 10°  
B 22°(4°)50°

$\alpha$  or  $\beta$   
Schedules

DELTA WING BOOSTER  
GD/C  
DR#1121 A-1- 391

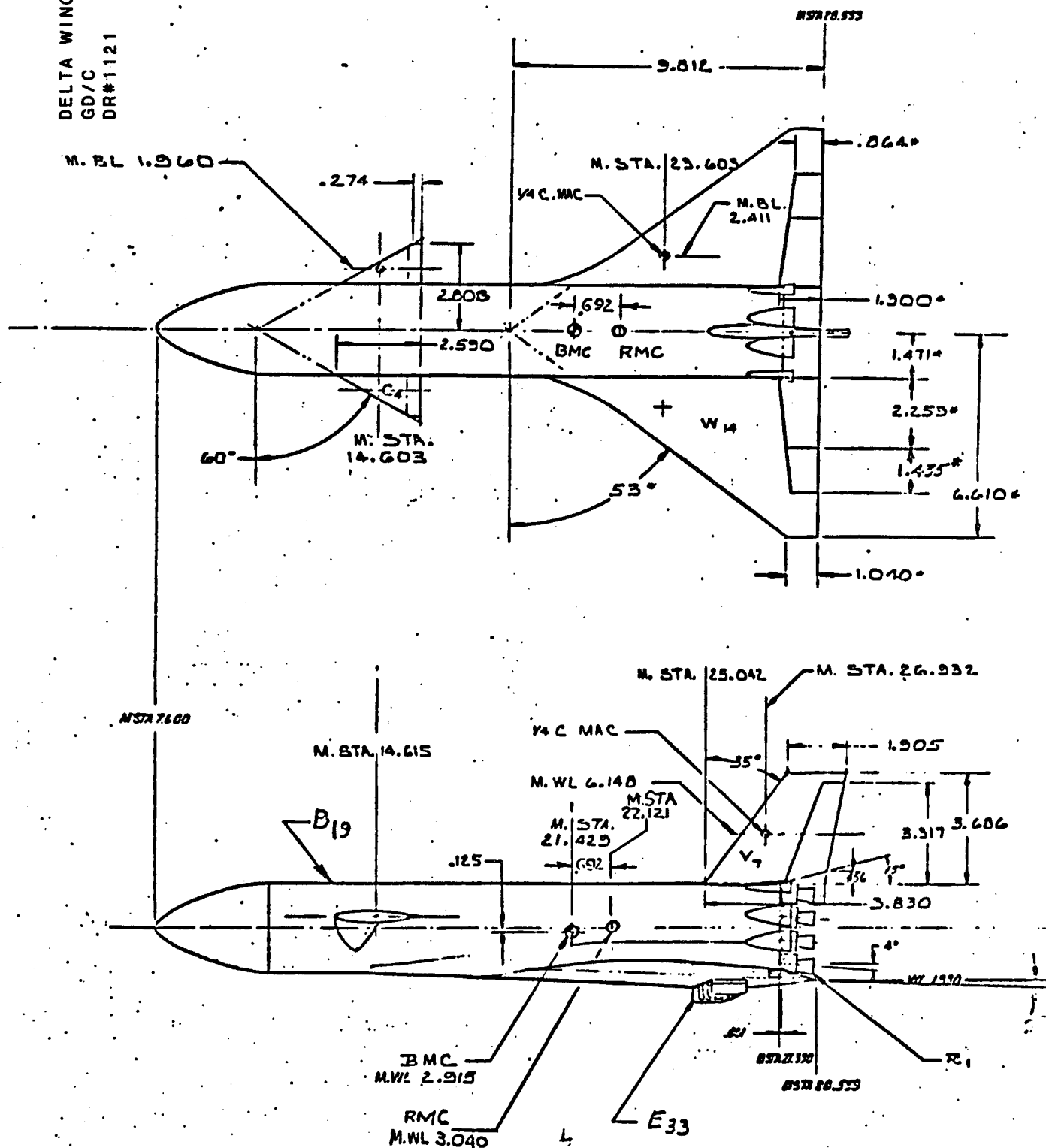
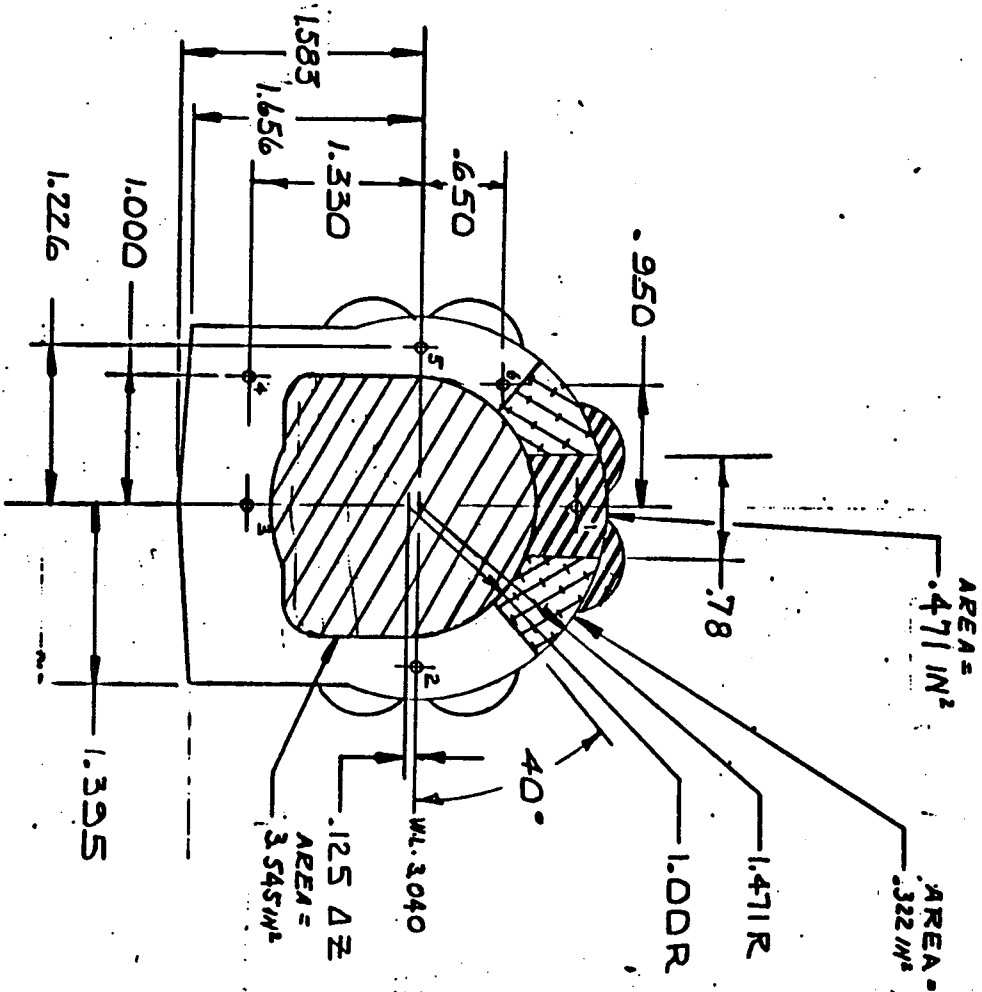


Figure 2. Model General Arrangement and Moment Reference Centers

STR. STING TOT. BASE AREA = 8.666 IN<sup>2</sup>  
 BLADE TOTAL BASE AREA = 8.452 IN<sup>2</sup>



24  
 SYM (EXCEPT AS NOTED)

Figure 4. Base Cavity Area and Pressure Orifice Locations

TABLE 1.  
TEST AMES 66-563 DATA SET/RUN NUMBER  
COLLATION SUMMARY

DELTA WING BOOSTER  
GD/C  
DR#1141 A-1- 394

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION							NO. OF RUNS	MACH						POSTTEST			
		α	β	I <sub>c</sub>	δa <sub>L</sub>	δe <sub>L</sub>	δe <sub>R</sub>	δa <sub>R</sub>	δr	δp		0.6	0.9	1.2	1.5	2.0					
RBA 150	B22C8W19V10R2	A	2.5	0	0	0	0	0	0	-	5	5	4	3	2	1					
158					10	0	0	-10		-	5	10	9	8	7	6					
154					10	10	10	10		-	5	15	14	13	12	11					
254		B	0		10	10	10	10		-	5	20	19	18	17	16					
250					0	0	0	0		-	5	25	24	23	22	21					
251				-20						-	5	30	29	28	27	26					
252				-30						-	5	35	34	33	32	31					
256				+10						-	5	40	39	38	37	36					
257				+30						-	5	45	44	43	42	41					
253				0	-10	-10	-10	-10		-	5	50	49	48	47	46					
255					-20	-20	-20	-20		-	5	55	54	53	52	51					
258					10	0	0	-10		-	5	60	59	58	57	56					
259					0			0	10	-	5	75	74	73	72	71					
260	B22C8W19V10R2F7L								0	40	5	80	79	78	77	76					
220	B22W19R2V10			-						-	5	85	84	83	82	81					
210	B22V10R2			-	-	-	-	-		-	5	65	64	63	62	61					
230	B22C8V10R2			0	-	-	-	-		-	5	70	69	68	67	66					
25A	B22C8W19V10R2			20	0	0	0	0		-	5	90	89	88	87	86					
340	B22C8W19R3	C		0	0	0	0	0	-	-	5	95	94	93	92	91					

TEST RUN NUMBERS

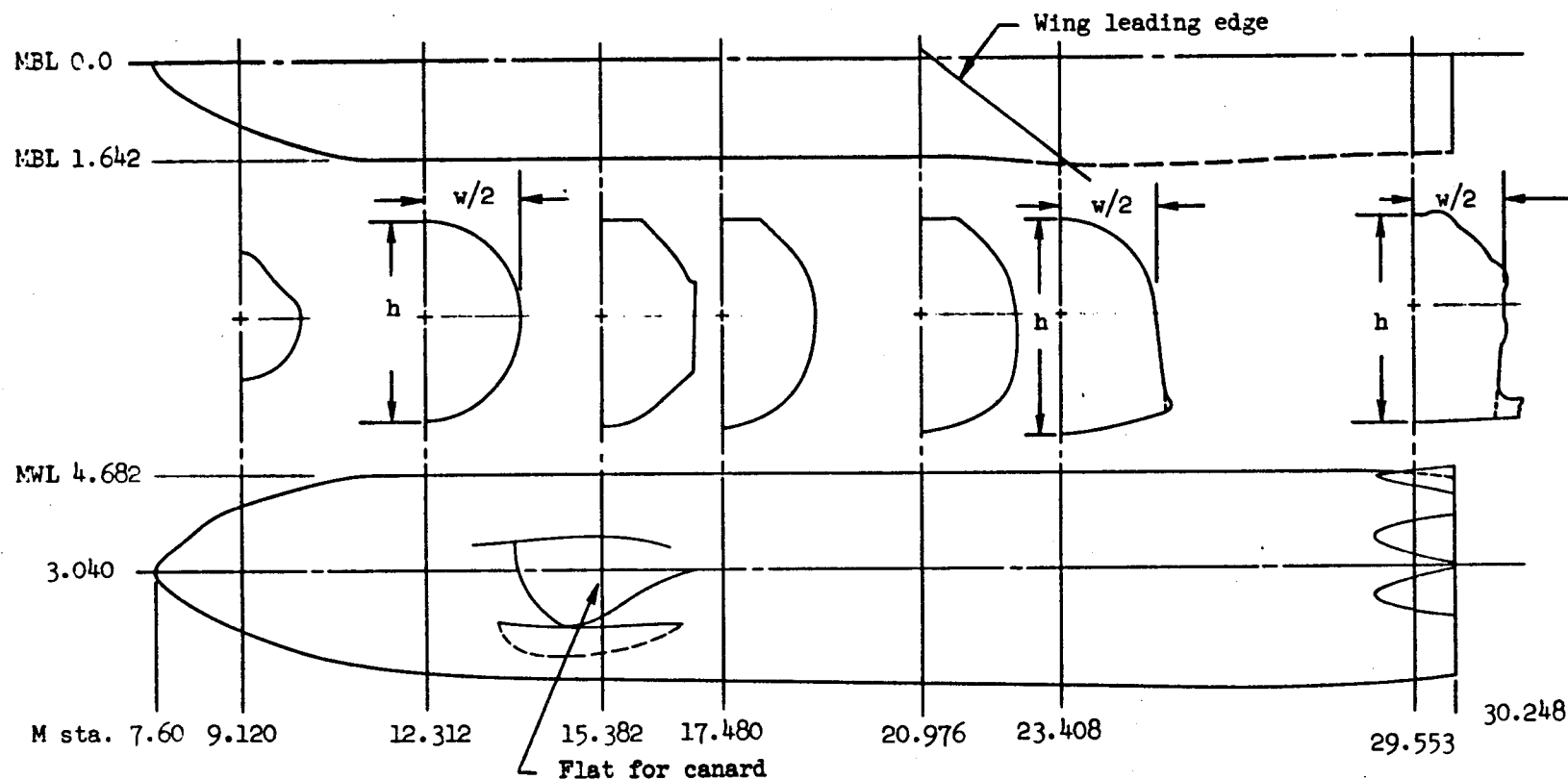
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1	7	13	19	25	31	37	43	49	55	61	67	75	76
CN	ICA	CLM	ICBL	ICYN	ICY	CAB	CAC	L/D					10
COEFFICIENTS:													IDPVAR(1) IDPVAR(2) NDV
$\alpha$ or $\beta$													
SCHEDULES													
$\alpha A = -6, -2, 0, 2, 4, 8, 12, 16, 0^\circ$													
$\alpha B = -2, 0, 2, 4, 8, 12, 16, 20, 24, 26, 0^\circ$													
$\alpha C = 20, 24, 28, 32, 36, 40, 44, 48, 32^\circ$													

NASA-MSFC-MAF



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Model dimensions in inches

M sta.	9.120	12.312	15.382	17.480	20.976	23.408	29.553
h	2.182	3.427	3.535	3.566	3.622	3.665	3.687
w/2	1.052	1.638	1.638	1.638	1.638	1.638	1.638

Figure C . Booster Body

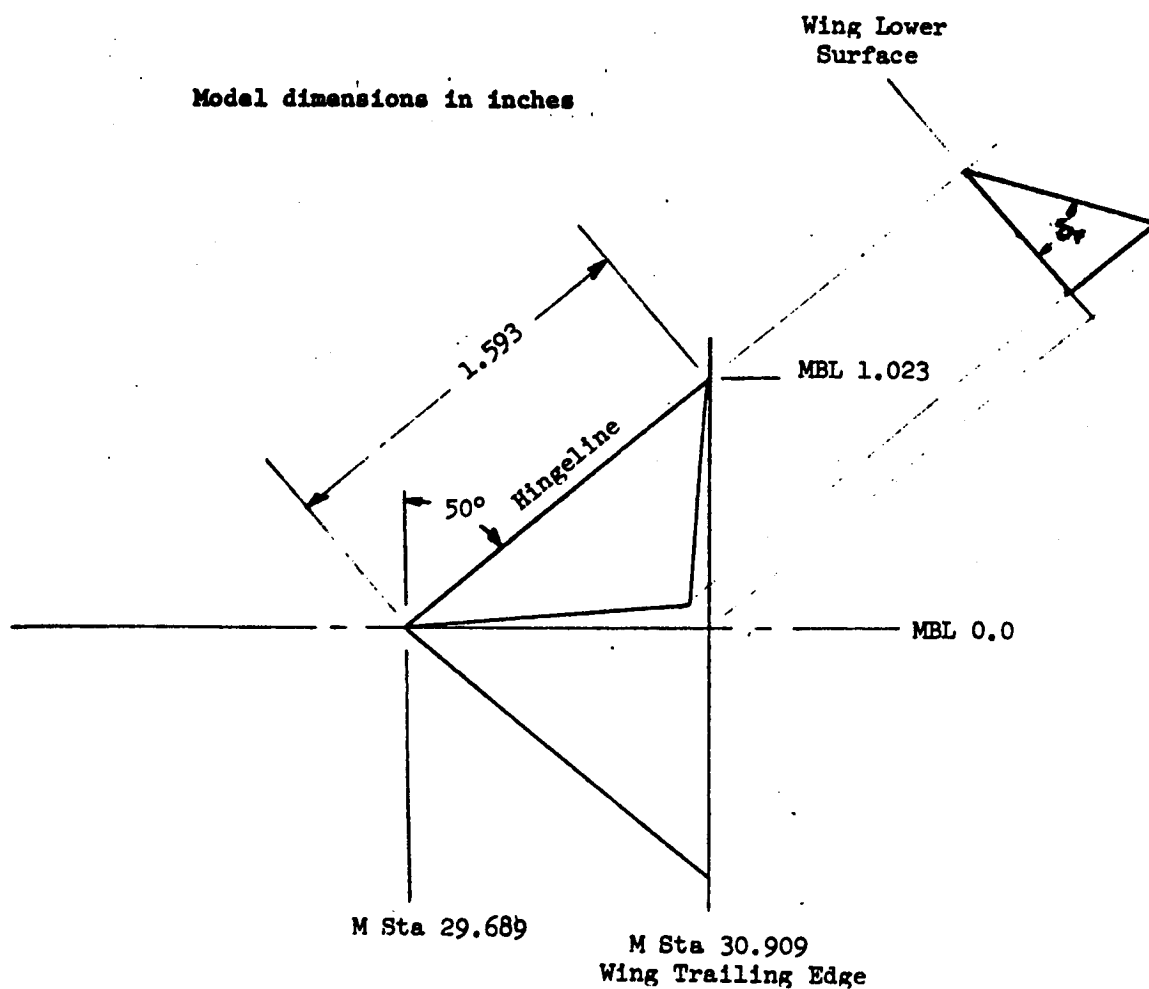


Figure D Body Flap,  $F_7$



STR. STIMG TOT. BASE AREA = 8.853 IN<sup>2</sup>  
BLADE TOTAL BASE AREA = 8.478 IN<sup>2</sup>

DELTA WING BOOSTER  
GD/C  
DR#1141 A-1- 398

MANIFOLD GROUPS

9, 5, 4, 3, 2, 1  
 TUBES  
 TUBES  
 TUBES

UPPER LOBES NOT  
USED WITH BLADE STING

$$AREA = 444 \text{ m}^2$$
$$-AREA = .261112$$
$$AREA = 4.016 \text{ m}^2$$

1.063 R.

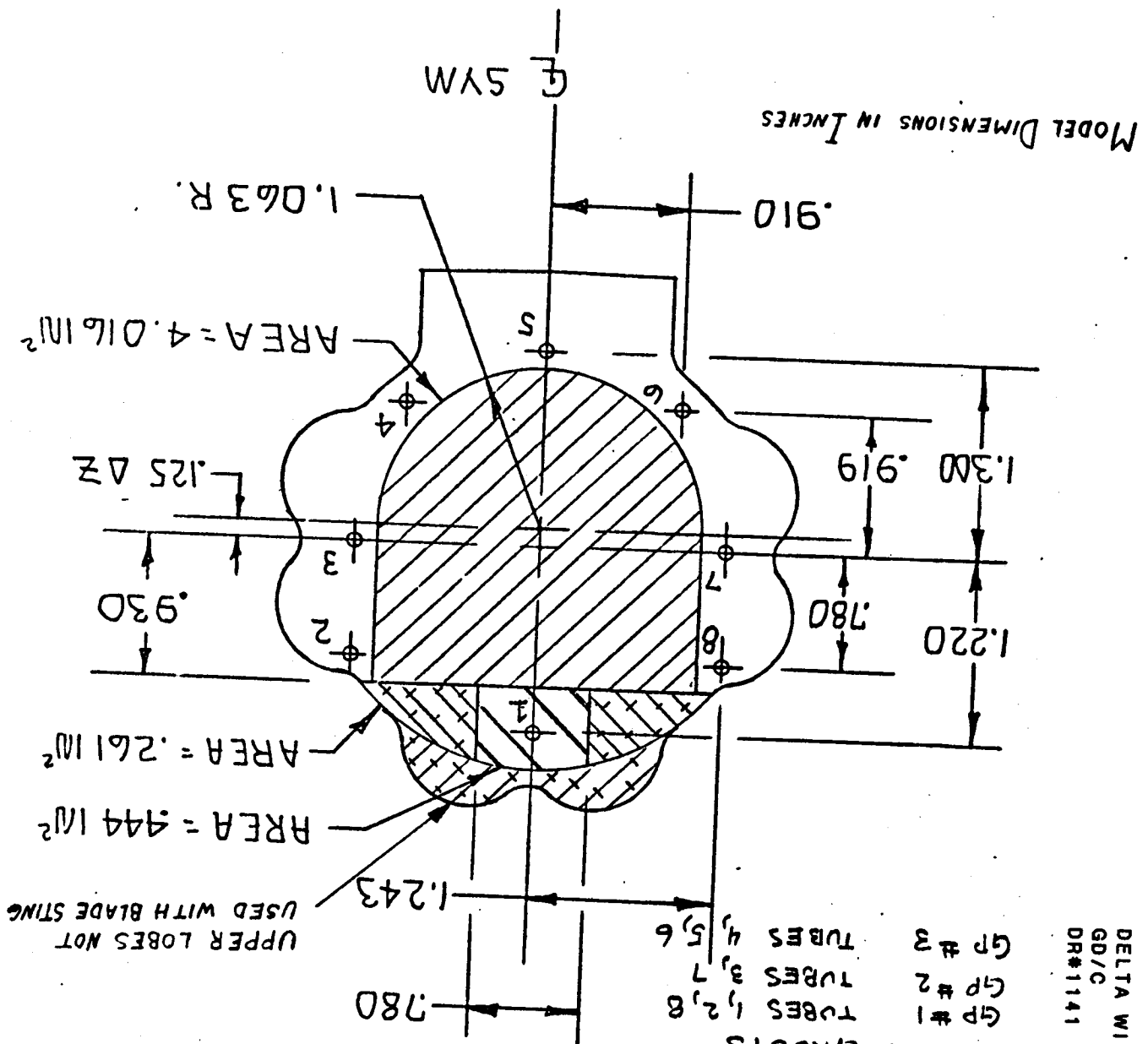


Figure E Base Geometry and Pressure Tap Locations

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OF POOR QUALITY

TEST LTP-64 DATA SET COLLATION SHEET

☐ PRE-TEST  
☐ POST TEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION					NO. OF RUNS		REYNOLDS NUMBER X 10 <sup>-4</sup> PER FOOT				
		$\alpha$	$\beta$	$\delta_1$	$\delta_2$	$\delta_3$	$\delta_4$	$\delta_5$	1	2	2.4	4.0	5.9	7.9	11.5

RMCD01	$B_{11}R_1W_1V_1C_1E_{12}$	A	0	0	0	0	0	0	0	7	1	2	3	4	7	6	5		
RMCD02	$B_{11}R_1W_1V_1C_1E_{12}$			0	0	0	0	0	0	7	8	9	10	11	12	13	14		
RMCD04	$B_{11}R_1W_1V_1C_1E_{12}$			+5	0	0	0	0	0	2			15	16					
RMCD05				+10	0	0	0	0	0	1				17					
RMCD06				-5	0	0	0	0	0	1				18					
RMCD07				-10	0	0	0	0	0	1				20					
RMCD08				-10	-5	-5	-5	-5	-5	1				21					
RMCD09				-10	-10	-10	-10	-10	-10	1				22					
RMCD10				0	-10	-10	-10	-10	-10	1				23					
RMCD11				0	-5	-5	-5	-5	-5	1				24					
RMCD12	$B_{11}R_1W_1V_1C_1E_{12}$			0	0	0	0	0	0	3			25	26	27				
RMCD13	$B_{11}R_1W_1V_1C_1E_{12}$			0	0	0	0	0	0										
RMCD14	$B_{11}R_1C_1$			0	OFF	OFF	OFF	OFF	OFF	3			29	30	31				
RMCD15	$B_{11}R_1V_1C_1$			0	OFF	OFF	OFF	OFF	OFF	3			32	33	34				
RMCD16	$B_{11}R_1$			0	OFF	OFF	OFF	OFF	OFF	3			35	36	37				
RMCD17	$R_1R_1W_1$			0	0	0	0	0	0	3			38	39	40				
RMCD18	$B_{11}R_1W_1V_1$			OFF	0	0	0	0	0	1					41				
RMCD19	$B_{11}R_1W_1V_1C_1E_{12}$			0	0	0	0	0	0	3			42	43	44				
RMCD20				0	0	0	0	0	0	1									

coefficients:  
u or B  
Schedules  
 $\Delta\alpha = -4.0$  TO  $21.0$  DEG  
 $\Delta\alpha = 2.0$  DEG  
 $\rightarrow$  IDPVAR(1) IDPVAR(2) N EV

DELTA WING BOOSTER  
GD/C  
DR#1150 A-1- 399

TEST LTP7-64 DATA SET COLLATION SHEET

☐ PRE-TEST  
☒ POST TEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION							NO. OF RUNS	REYNOLDS NUMBER X 10 <sup>-6</sup> PER FOOT						
		A	B	$\delta_{LE}$	$\delta_{AL}$	$\delta_{EL}$	$\delta_{AR}$	$\delta_{EP}$	$\delta_{AR}$			2.4	4.0	5.9	7.9	9.7	11.5	14.4
PMCO21	B <sub>12</sub> R <sub>2</sub> W <sub>10</sub> V <sub>10</sub> C <sub>8</sub> E <sub>17</sub>	A	0	0	-5	5	-5	-15	0		3		46	47	48			
PMCO22				0	0	-5	-10	-5	0		1				49			
PMCO23				0	5	-5	-15	-5	0		3		50	51	52			
PMCO24				0	-5	-5	-5	-5	10		1				53			
PMCO25				0	-5	-5	-5	-5	20		3		54	55	56			
PMCO26				0	5	5	5	5	0		1				57			
PMCO27				20	5	5	5	5	0		1				58			
PMCO28	B <sub>12</sub> R <sub>2</sub> W <sub>17</sub> C <sub>8</sub> E <sub>17</sub>		5	10	0	0	0	0	OFF		3		61	60	59			
PMCO29				0	0	0	0	0	OFF		1				62			
PMCO30	B <sub>12</sub> R <sub>2</sub> W <sub>17</sub> V <sub>10</sub> C <sub>8</sub> E <sub>17</sub>			0	0	0	0	0	0		1				63			
PMCO31				10	0	0	0	0	0		3		64	65	66			
PMCO32	B <sub>12</sub> R <sub>2</sub> W <sub>17</sub> V <sub>10</sub> E <sub>17</sub>			OFF	0	0	0	0	0		1				67			
PMCO33	B <sub>12</sub> R <sub>2</sub> C <sub>8</sub> V <sub>10</sub>			0	OFF	OFF	OFF	OFF	0		1				68			
PMCO34	B <sub>12</sub> R <sub>2</sub> C <sub>8</sub>			0	OFF	OFF	OFF	OFF	OFF		1				69			
PMCO35	B <sub>12</sub> R <sub>2</sub>			OFF	OFF	OFF	OFF	OFF	OFF		1				70			
PMCO36	B <sub>12</sub> R <sub>2</sub> W <sub>17</sub>			OFF	0	0	0	0	OFF		1				71			
PMCO37	B <sub>12</sub> R <sub>2</sub> W <sub>17</sub> V <sub>10</sub>			OFF	0	0	0	0	0		1				72			
PMCO38	B <sub>12</sub> R <sub>2</sub> W <sub>17</sub> V <sub>10</sub> E <sub>17</sub>		0	OFF	0	0	0	0	0		3		73	74	75			
PMCO39				OFF	5	5	5	5	0		3		76	77	78			
PMCO40				OFF	-10	-10	-10	-10	0		3		79	80	81			

1 7 13 19 25 31 37 43 49 55 61 67 73 79

Coefficients:  $\alpha = -4.0$  TO  $21.0$  DEG  $\Delta\alpha = 2.0$  DEG LDPVAR(1) LDPVAR(2) H DV

$\alpha$  or  $\beta$

Schedules

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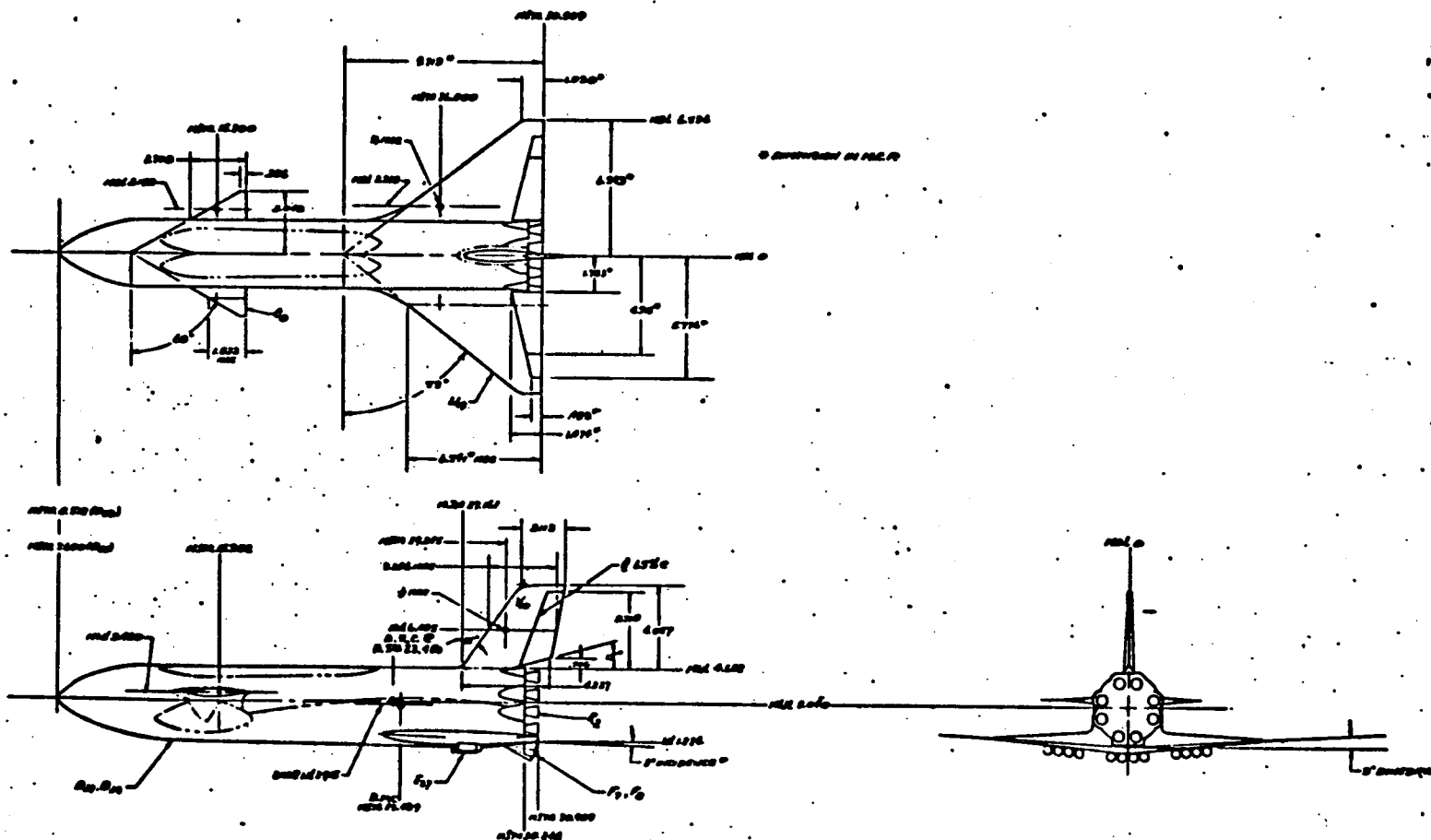
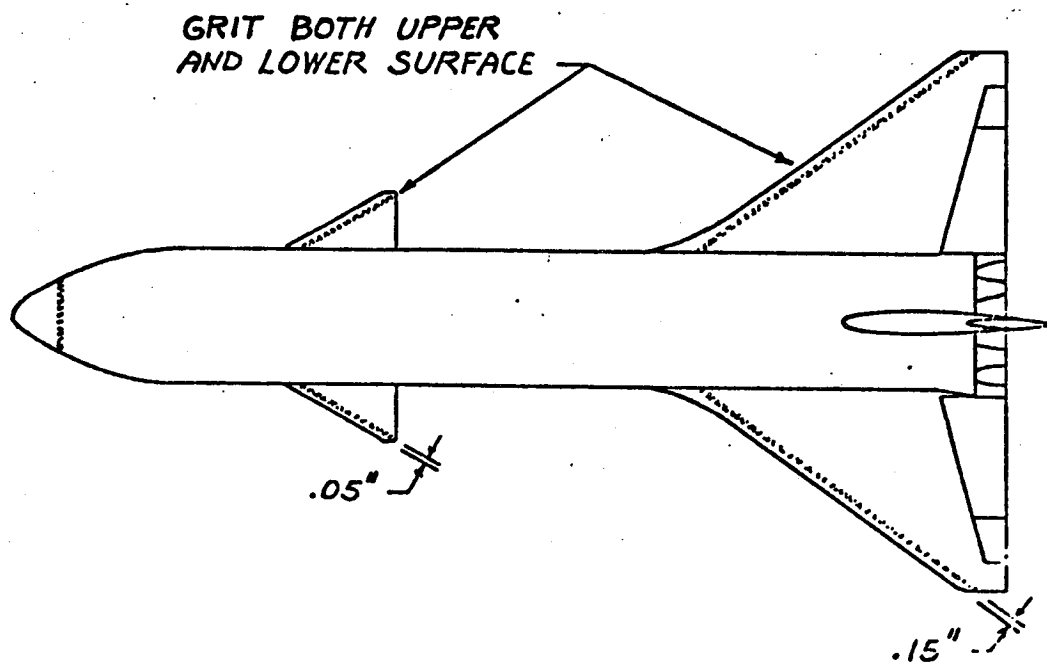


Figure 1. General Arrangement - 0.0076 Scale B-9U  
Space Shuttle Booster.

DELTA WING BOOSTER  
GD/C  
DR#1150 A-1- 402



STRIP WIDTH .05" TYP.  
APPLY #180 GRIT

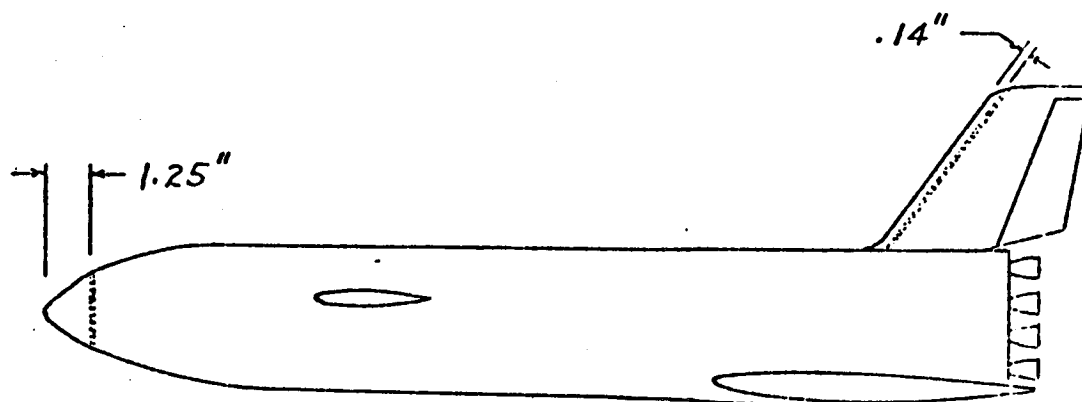


Figure 2. Grit Strip Location

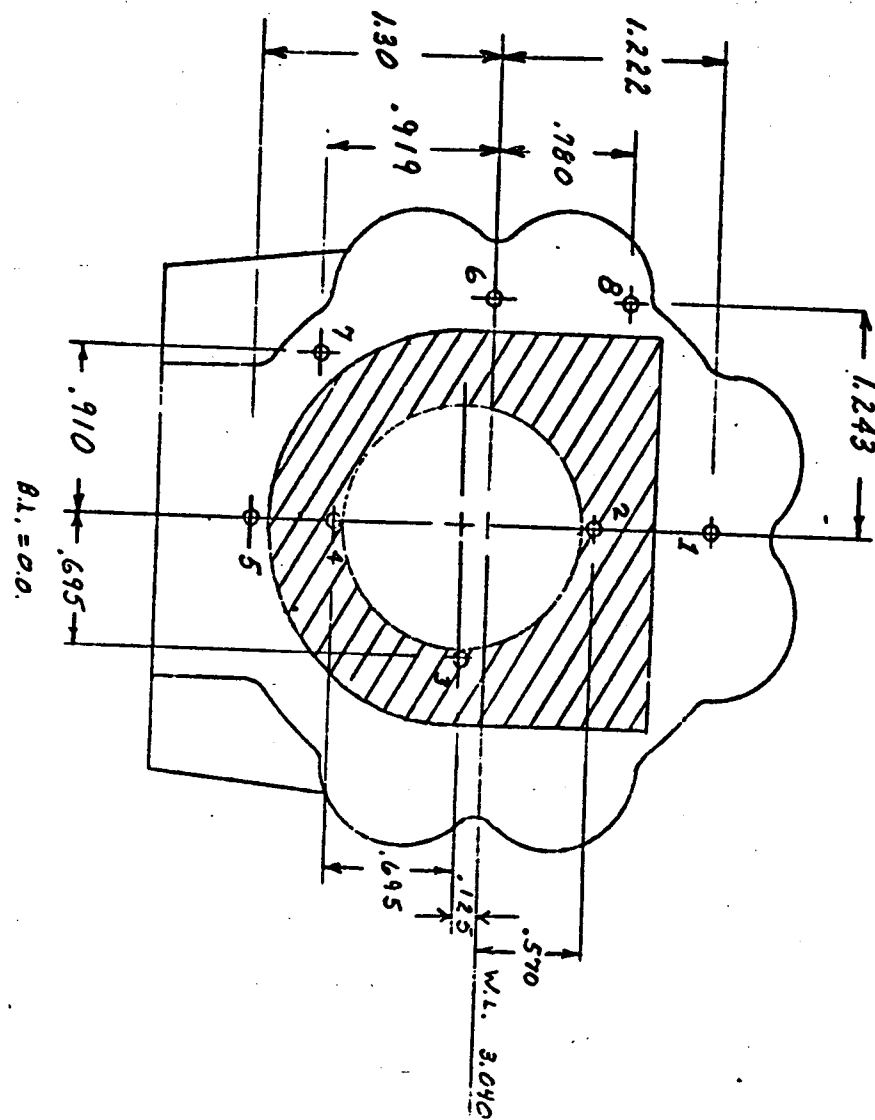


Figure 7. Base Pressure Orifice Locations

TEST MSFC TW7 493 DATA SET/RUN NUMBER  
COLLATION SUMMARY

DELTA WING BOOSTER  
GD/C  
DR#1152 A-1- 404

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)												
		a	B	dc	da	de	df		0.60	0.90	0.95	1.0	1.05	1.20	1.50	2.0	2.74	3.0	4.5	5.0	
R35EAO	B25 W19 C8 V10	A	0	0	0	0	0	10	35	36	37	38	39	40	62	1	65	64			
EBO	B25 W19 C8	B				0		3								94		100	99		
EAA	B25 W19 C8 V10	A				10		8	88	43		42		41		2	68	67		66	
EBA	B25 W19 C8	B				10		2										102	101		
EAB	B25 W19 C8 V10	A				-20		7	89	44		45		46		3	70	69			
EBB	B25 W19 C8	B				-20		2										104	103		
EAC	B25 W19 C8 V10	A		0		-10		6		49		48		47		4	71	71			
CAA	B25 W19 C8 V10	A		-15		0		4		50		51		52		5					
CBA	B25 W19 C8	B		-15				2										108	107		
CAB	B25 W19 C8 V10	A		-30				6		55	54			53		6					
CBB	B25 W19 C8	B	0	-30				2										74		73	
OCA	B25 W19 C8	30	C	0				3										110	109		
OCB	B25 W19 C8	25						6		90		91		92				112	111	118	
TCC	B25 W19 C8 V10	15						6				28		29	56	7		106		105	
TCD	B25 W19 C8 V10	6	C					4						63	61			76		75	
TDA	B25 W19 C8 V10	0	D			0		7		19		20		21	60	12		81		80	
RDB	B25 W19 C8 V10	0	D			10		6				23		22	59	14		83		82	
OCCL	B25 W19 C8	15	C			-		6				27		26	57	8		85		84	
ODA	B25 W19 C8	0	D		0	-		4				24		25	58	13		78		77	
R35ADA	B25 W19 C8 V10	0	D	0	10	0	0	6		18		17		16		15		87		86	

TEST RUN NUMBERS

TEST RUN NUMBERS

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1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM KN CA CY CBL CYN CAB CAC

COEFFICIENTS:  $\alpha(A) = 5^\circ \text{ to } 25^\circ$   $\beta(C) = -10^\circ \text{ to } 10^\circ$  IDPVAR(1) IDPVAR(2) NDV

a or B  $\alpha(B) = 20^\circ \text{ to } 40^\circ$   $\beta(D) = -4^\circ \text{ to } 10^\circ$

SCHEDULES

NASA-MSFC-MAP

## COLLATION SUMMARY

~~Q~~ POSTTEST

### α or β SCHEDULES

DELTA WING BOOSTER  
GD/C  
DR#1152      A-1- 405



DELTA WING BOOSTER  
GD/C  
DR#1152 A-1- 406

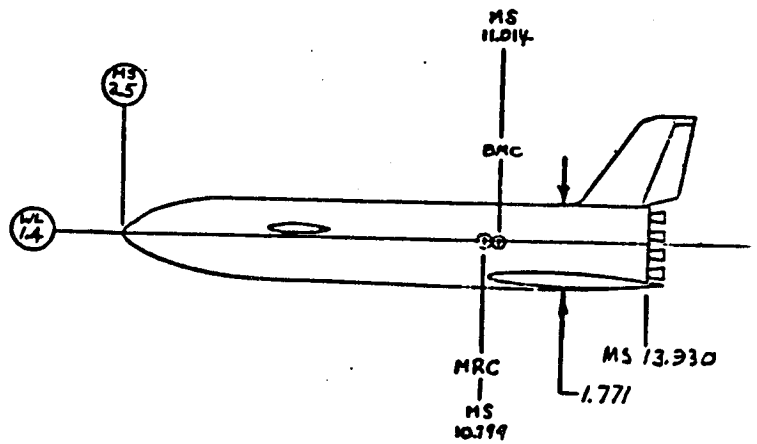
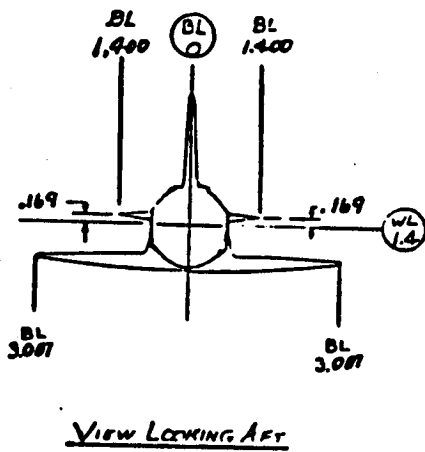
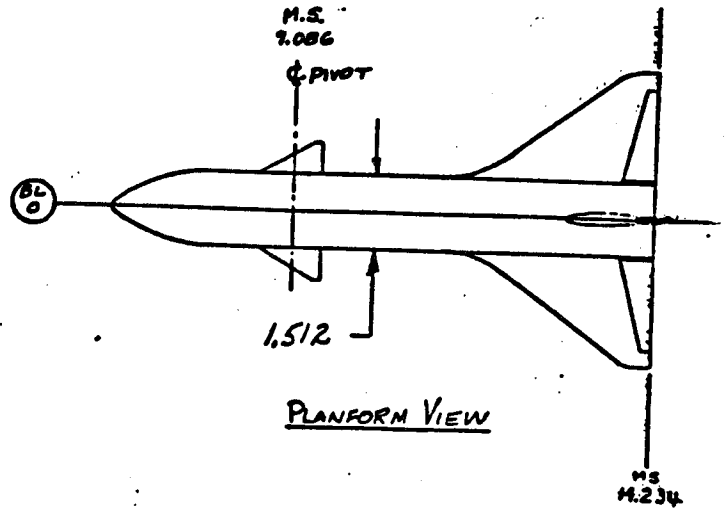
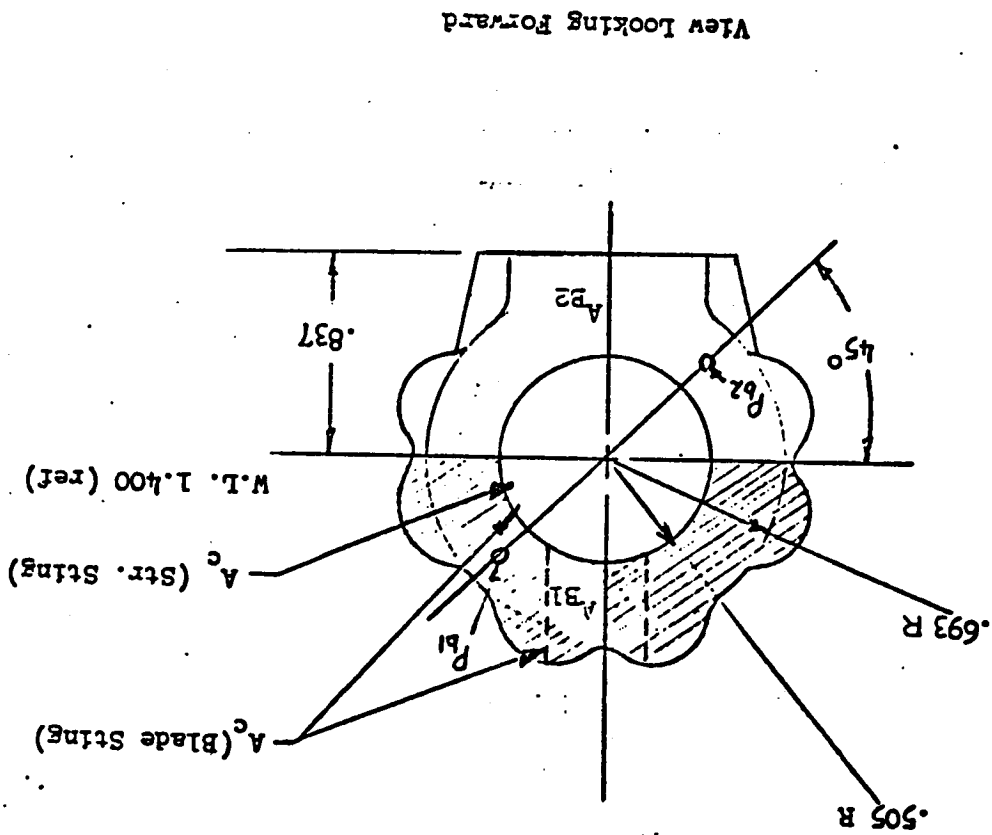


Figure 4. Model Three-View

Figure 6. Base Pressure Tap Locations



STRING CONFIG.		AREA (SQ. IN.)		TOTAL AREA
AB1	A32	A3		
STRAIGHT STRING	.454	.904	.801	2.159
BLADE STRING	.391	.904	.864	2.159

MEASURED DIMENSIONS

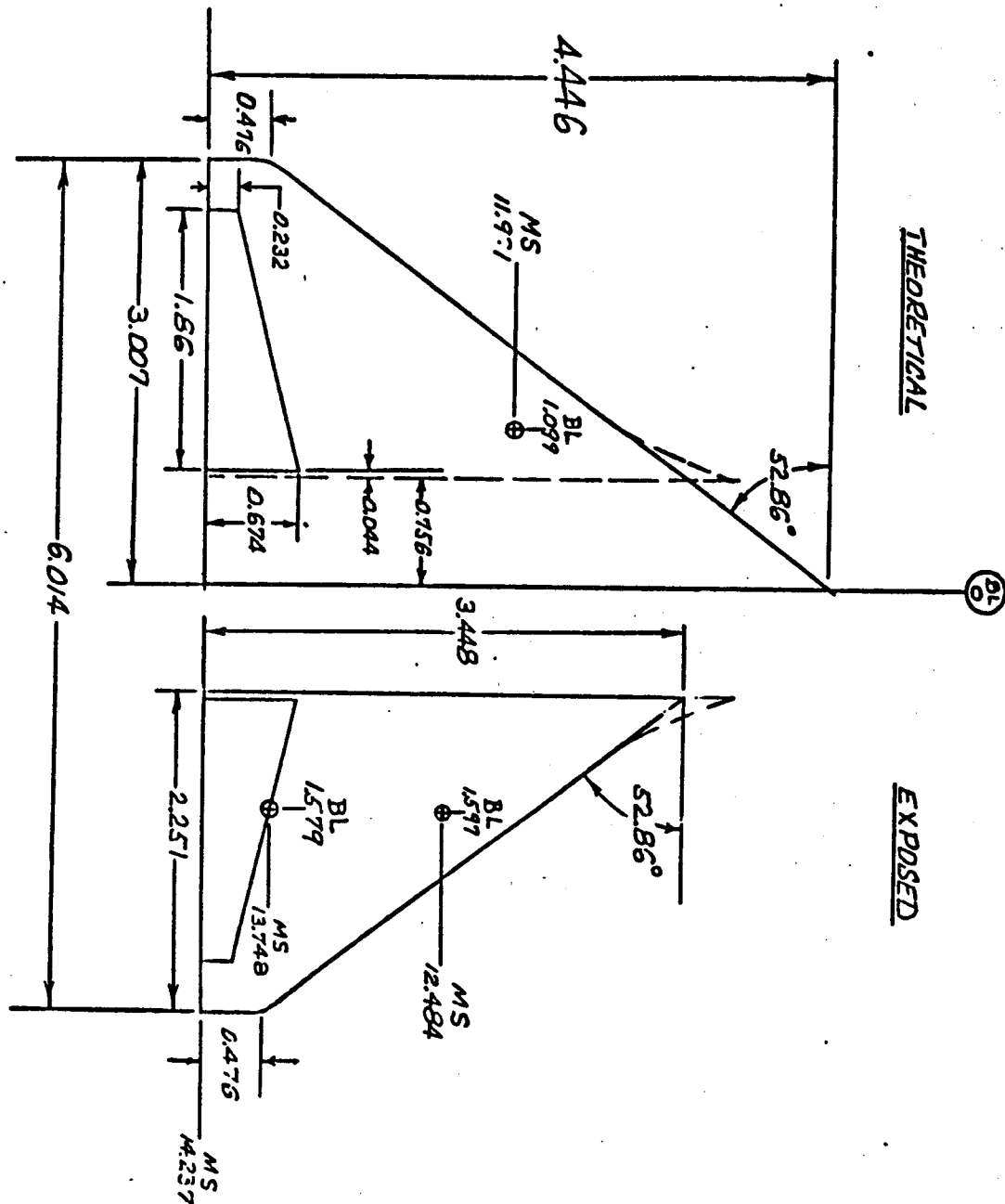


Figure 8. Wing - W<sub>19</sub>

MEASURED DIMENSIONS

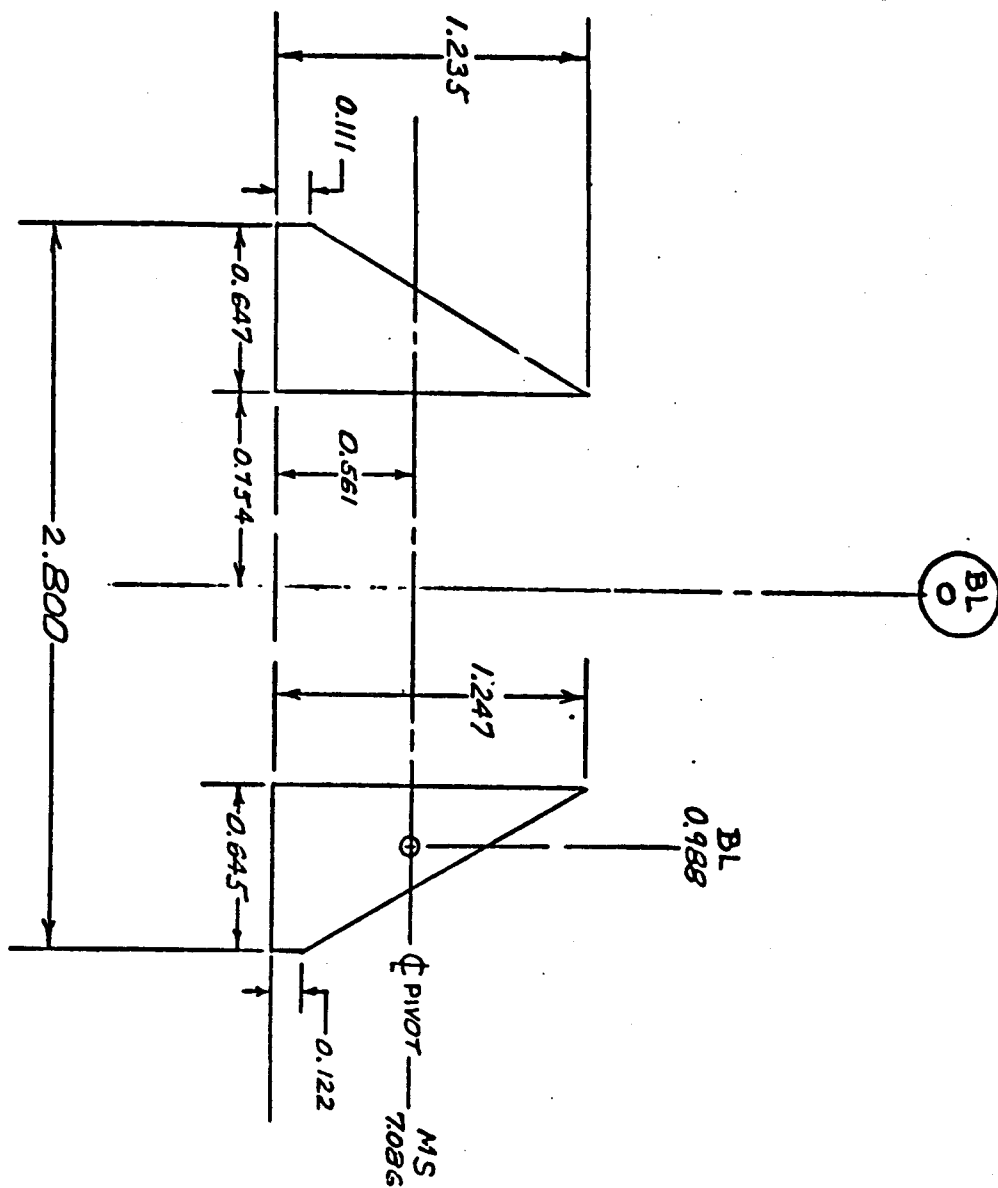


Figure 9. Canard - C<sub>8</sub>

DELTA WING BOOSTER  
GD/C  
DR#1152 A-1- 410

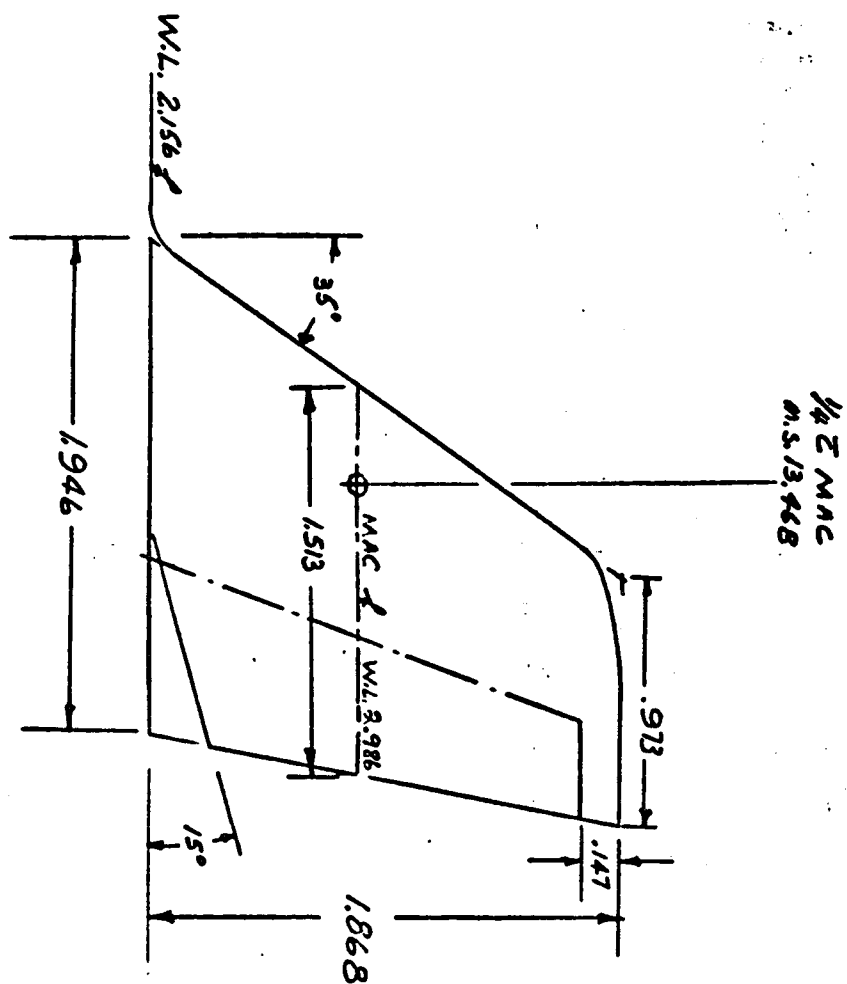


Figure 10. Vertical Tail - V<sub>10</sub>

FLAP PIVOTS DOWN FROM  
WING LOWER SURFACE

	$\frac{A}{B}$	$\frac{B}{A}$
$F_7$	.471	.561
$F_8$	.667	.795

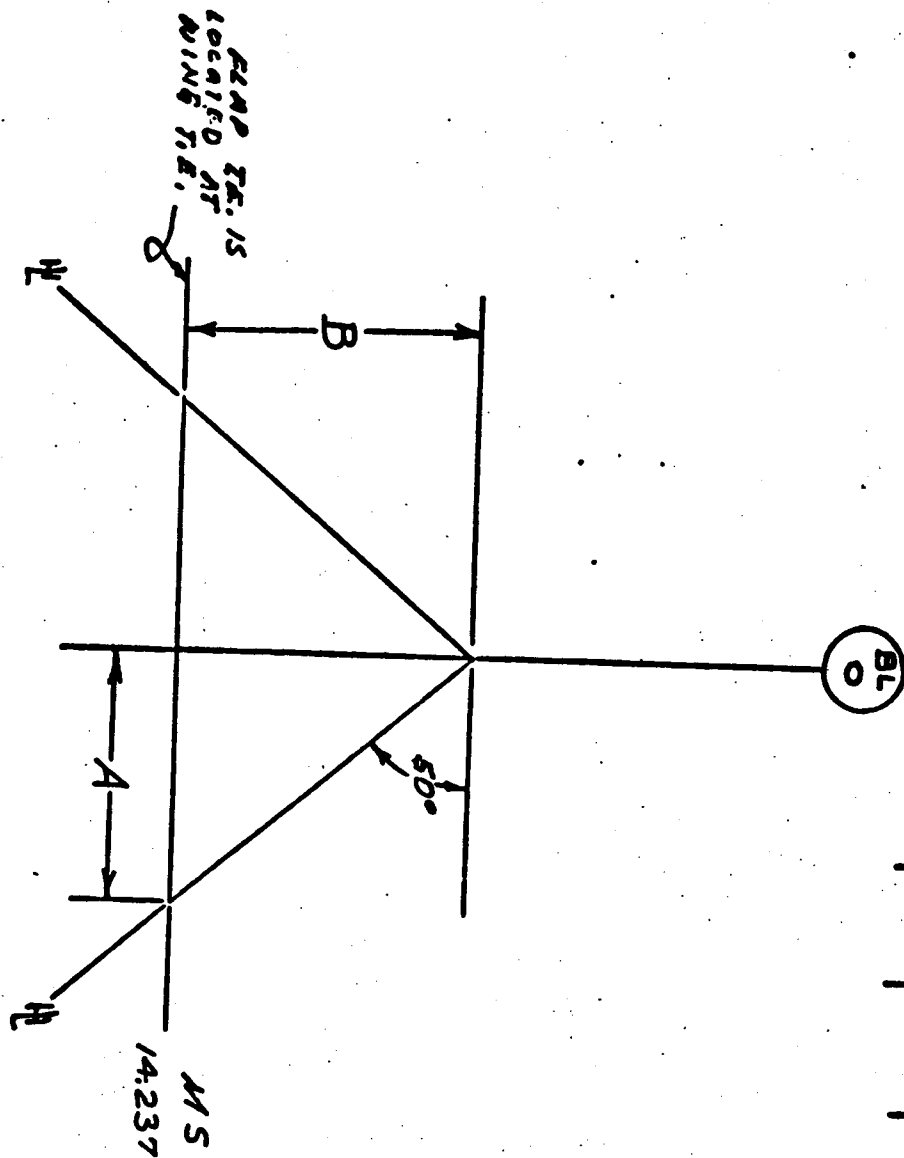


Figure 11. Body Flap -  $F_7$ ,  $F_8$

DELTA WING BOOSTER  
GD/C  
DR#1152 A-1- 412

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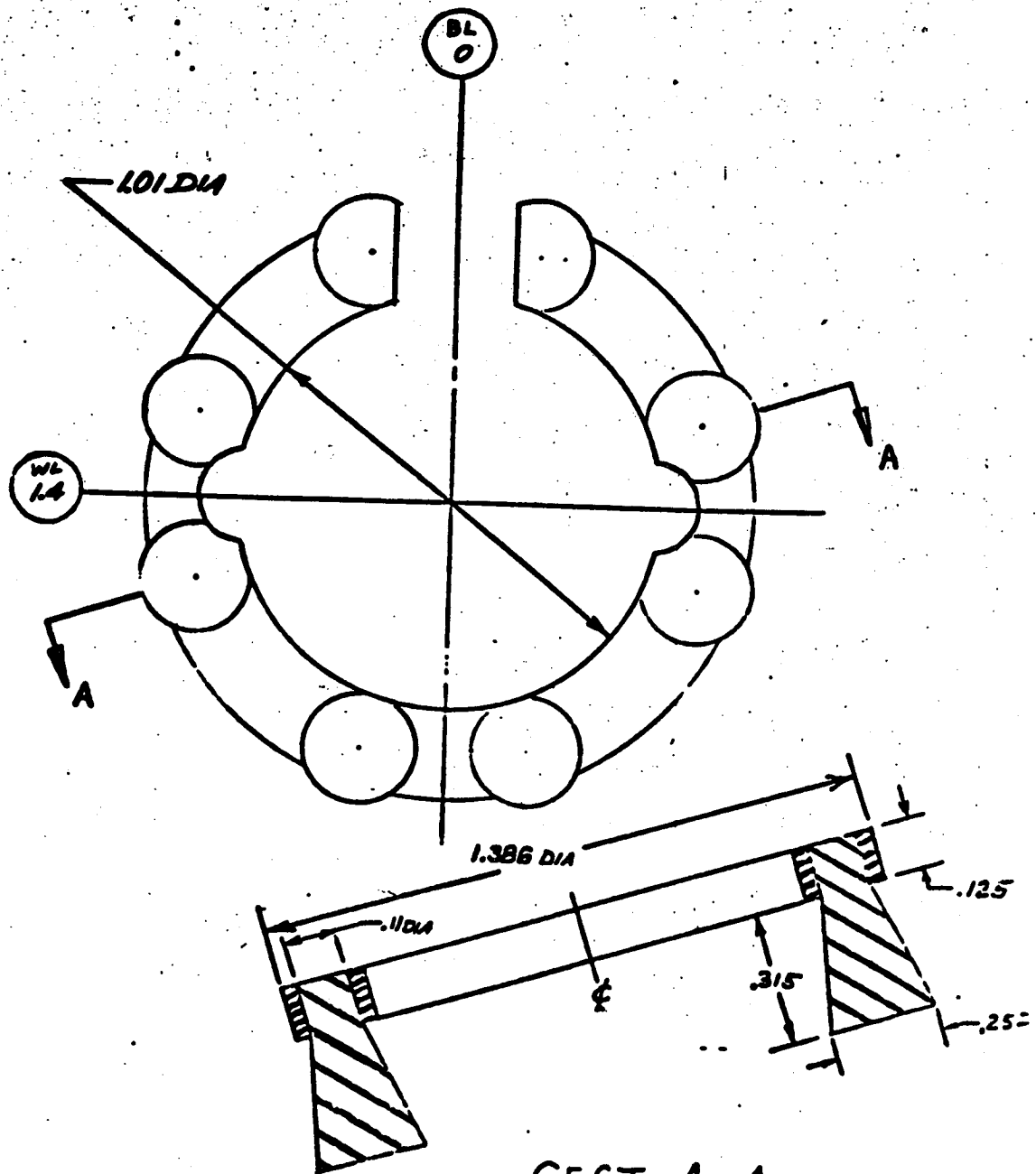


Figure 12. Rocket Engines - R<sub>4</sub>

# TEST MSFC 495 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B	P	Dr			1.2	1.3	1.46	1.96	2.74	2.97	4.96			
R37A31	B19W14C4AV7	A	0	3	0		7	35/0	3/0	37/0	33/0	57/1	58/0	59/0			
R37A32	B19W14C4A	B	↓		-		3				105/0		81/0	80/0			
R37Y31	B19W14C4AV7	6	C		0		3		1/0	45/0	24/0						
R37Y32	↓	15			↓		6		2/0	40/0	29/0	60/0	61/0	62/0			
R37Y33	B19W14C4A	25			-		2					73/0		72/0			
R37Y34	↓	35	↓		-		2					71/0		70/0			
R37A61	B19W20C4AV7	A	0	6	0		6		15/0	48/0	20/0	54/0	55/0	56/0			
R37A62	B19W20C4A	B	↓		-		3				97/1		83/1	82/1			
R37Y61	B19W20C4AV7	6	C		0		3		17/0	46/0	15/0						
R37Y62	↓	15			↓		3		16/0	47/0	14/0						
R37Y63	B19W20C4A	25			-		2						87/0	86/0			
R37Y64	↓	35	↓		-		2						85/0	84/0			
R37A01	B19W21C4AV7	A	0	10	0		6		14/0	49/0	21/0	51/0	52/0	53/0			
R37A02	B19W21C4A	B	↓		-		3				94/0	93/0		92/0			
R37Y01	B19W21C4AV7	6	C		0		2		12/0		23/0						
R37Y02	↓	15			↓		3		13/0	50/0	22/0						
R37Y03	B19W21C4A	25			-		2					89/0		88/0			
R37Y04	↓	35	↓		-		2					91/0		90/0			
R37AR1	B19W14C4AV13	A	0	3	50		2		8/0		36/0						
R37YR1		6	C				3		11/0	44/0	26/0						

1	7	13	19	25	31	37	43	49	55	61	67	73	76
CLM	ICN	ICYN	ICY	ICBL	CA	CAB	CPI	CP2	CPC				10

COEFFICIENTS:

A or B

SCHEDULES

CA = +5, 7, 9, 11, 13, 15, 17, 19, 21, 23 DEG.

CB = +25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45 DEG.

CC = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10 DEG.

DELTA WING BOOSTER

GD/C

DR#1155 A-1- 413



TEST MSFC 495 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B	P	Δr			1.2	1.3	1.4	1.6	2.74	2.99	4.96			
R37YR2	B19W14C4AV13	15	C	3	50		6		7/0	7/0	27/0	63/0	64/0	65/0			
R37AR2	B19W14C4AV12	A	O		25		2		9/0		34/0						
R37YR3		6	C				3		10/0	13/0	25/0						
R37YR4		15					3		6/0	12/0	25/0						
R37AL1	B19W14C4AV7F9L60	A	O		0		2			38/0	32/0						
R37AL2	B19W14C4AF9L60	B			—		3				103/0		77/0	76/0			
R37AL3	B19W14C4AF9L90	B			—		3				104/0		79/0	78/0			
R37AS1	B19W14C4AV7F9L60F9R60	A			0		2		4/0		31/0						
R37YS1		15	C				3		5/0	39/0	30/0						
R37YSR	B19W14C4AV13F9L60F9R60				50		2						66/0	67/0			
R37YS2	B19W14C4AF9L60F9R60	25			—		2					75/0		74/0			
R37YS3		35			—		2					69/0		68/0			
R37B01	B19C4A			—	—		1				98/0						
R37B02	B19FO			—	—		1				99/0						
R37B03		30		—	—		1				102/0						
R37B04	B19C4A			—	—		1				106/0						
R37B05	B19FOW14			3	—		1				107/0						
R37B06	B19W14C4A				—		1				108/0						
R37B07	B19			—	—		1				109/0						
R37B08	B19FO	10		—	—		1				111/0						

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
CLM CN ICYN ICY CBL CA CAB CPl CP2 CPC 10

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

a or b  
SCHEDULES

## 1

☒ POSTTEST

1	7	13	19	25	31	37	43	49	55	61	67	7576
CLM	ICN	ICYN	KY	ICBL	CA	CAB	CP1	CP2	CPC			10

**a or b**  
**SCHEDULES**

→ IDPVAR(1) | IDPVAR(2) | NDV

DELTA WING BOOSTER  
GD/C  
DR#1155      A-1- 415

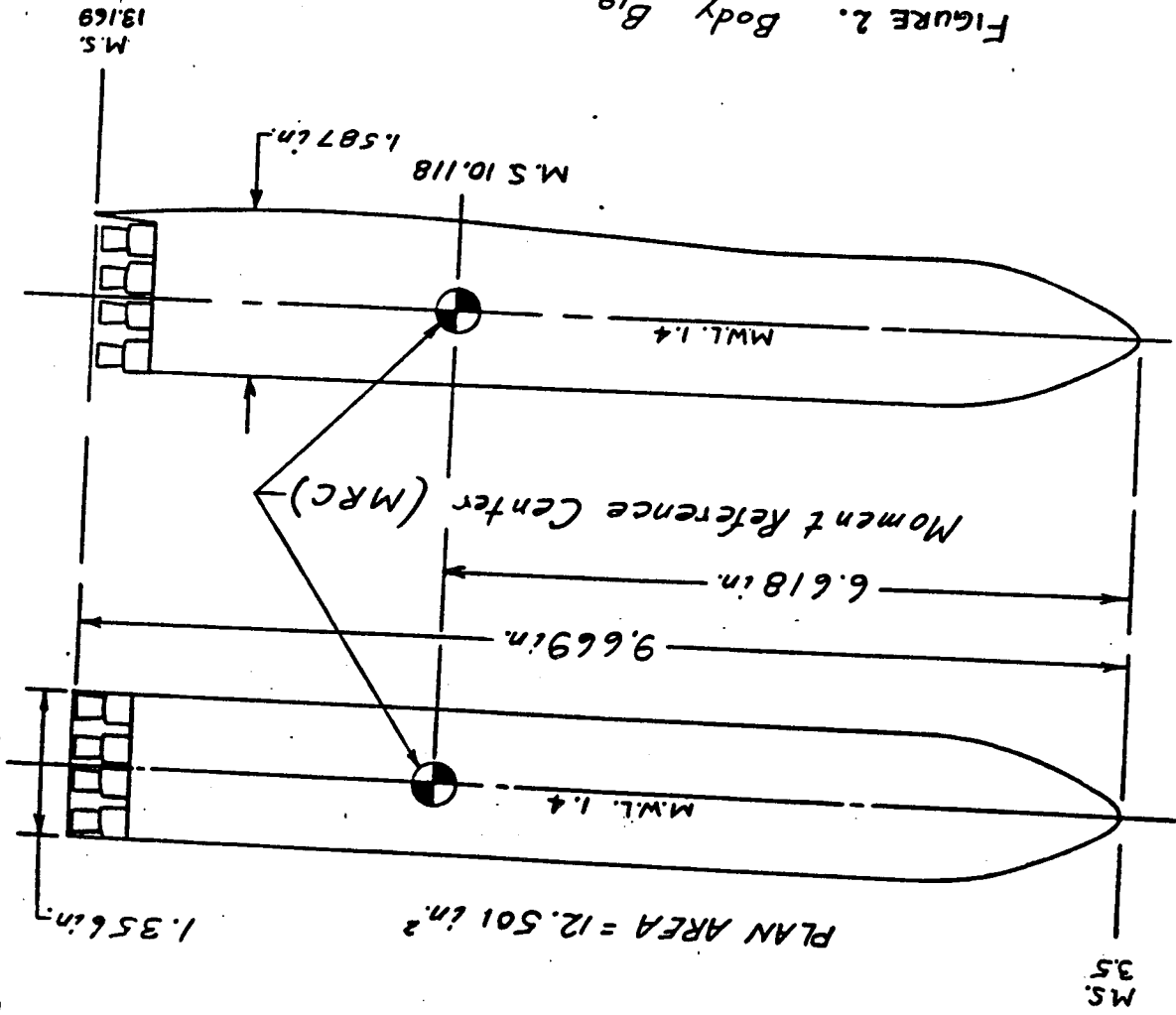
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DELTA WING BOOSTER  
GD/C  
DR#1155 A-1- 416

[illegible]

FIGURE 1. B-15B-1 GENERAL ARRANGEMENT

Figure 2. Body B<sub>19</sub>



DELTA WING BOOSTER  
GD/C  
DR#1155 A-1- 417

B19

W14

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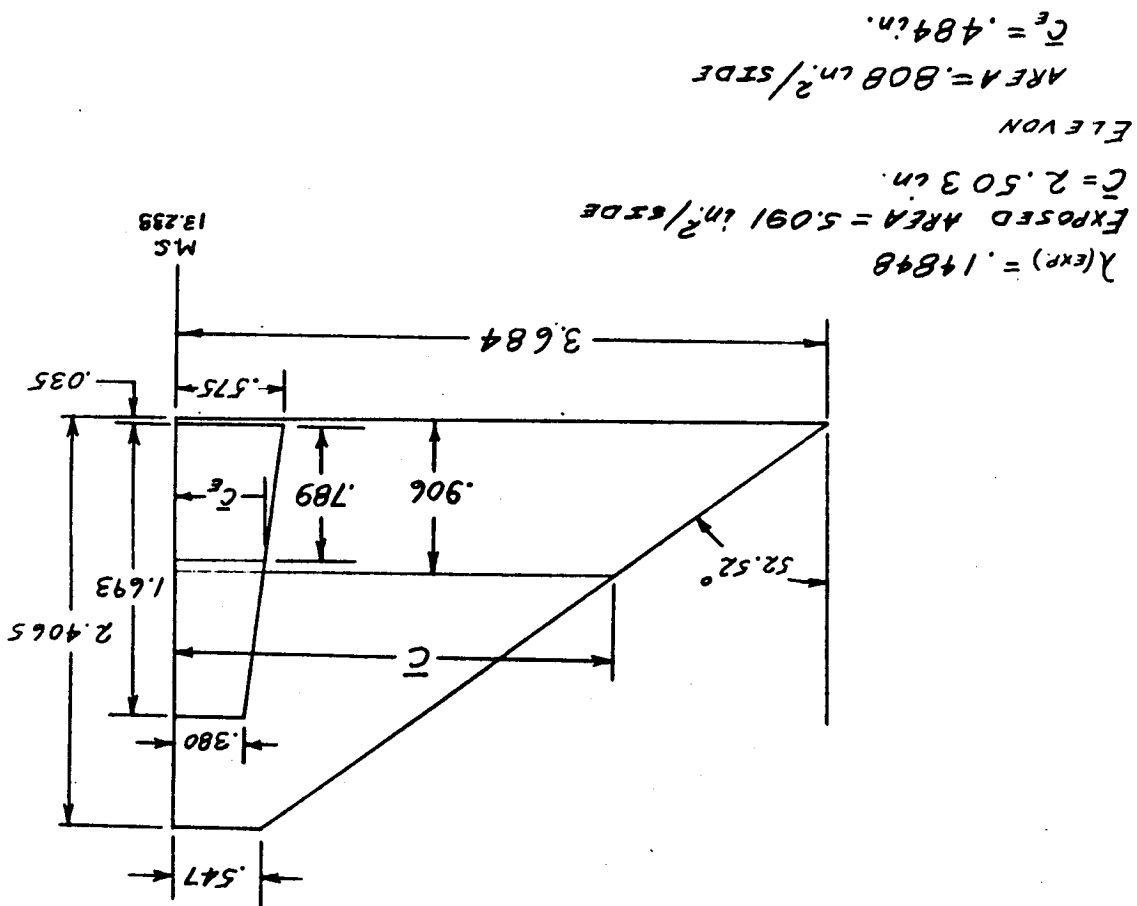
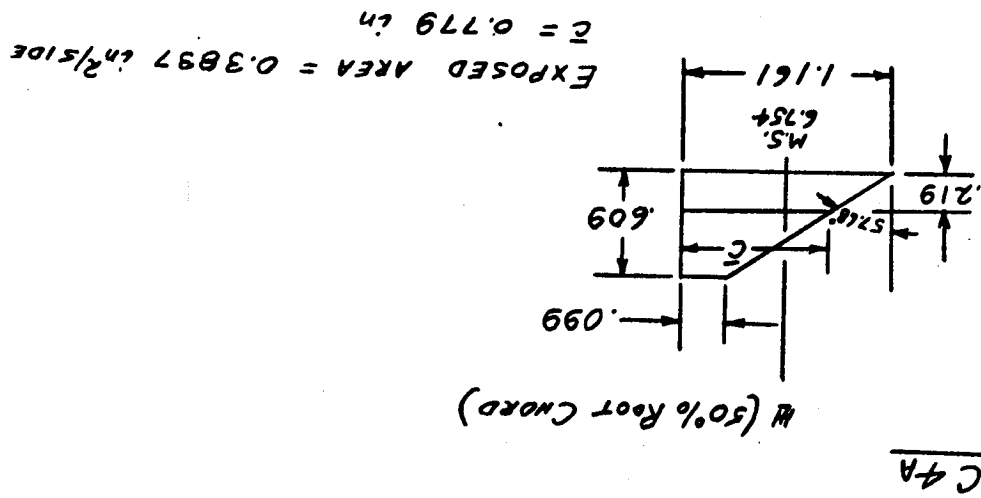


FIGURE 3. WING W14

FIGURE 4. CANARD C<sub>4A</sub>

DELTA WING BOOSTER  
GD/C  
DR#1155 A-1- 420

VERT.	$\Theta$
$V_7$	0
$V_{12}$	25°
$V_{13}$	50°

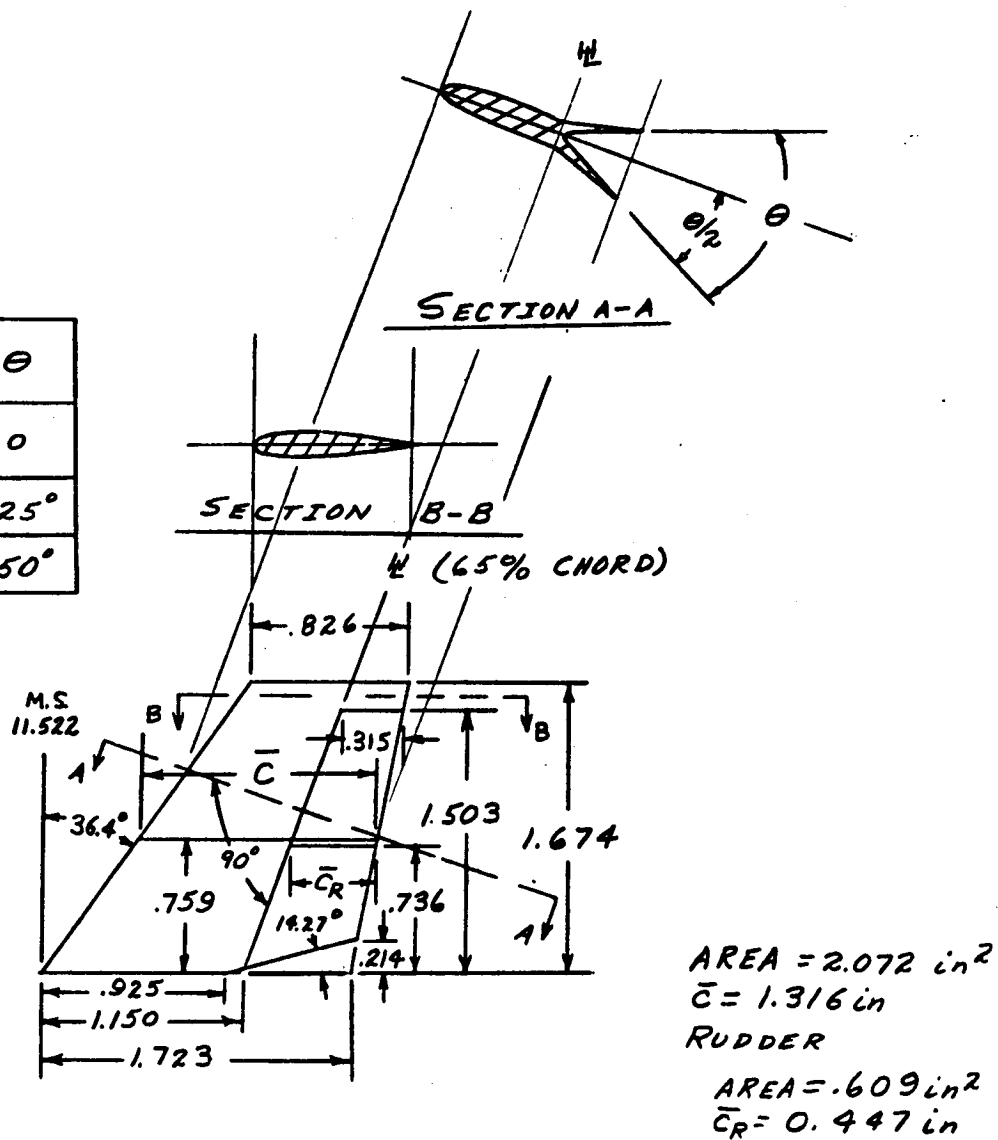


FIGURE 5. VERTICAL TAILS  $V_7$ ,  $V_{12}$ ,  $V_{13}$

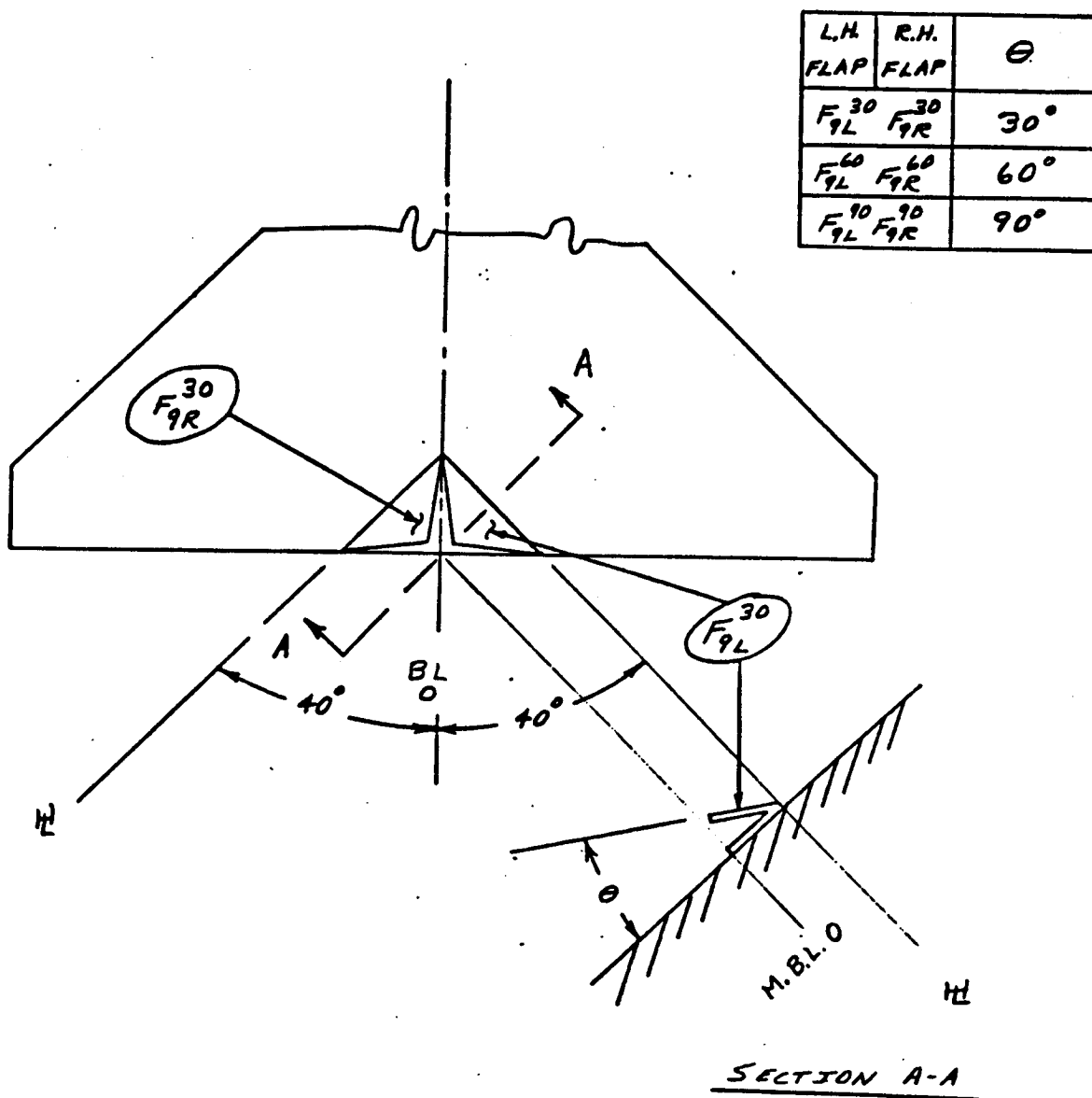


FIGURE 6. Body Flap  $F_9$



DELTA WING BOOSTER  
GD/C  
DR#1156 A-1- 422  
1 of 2

TEST CFBT 70 DATA SET/RUN NUMBER  
COLLATION SUMMARY

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIED	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	NOMINAL SIDESLIP ( $\beta$ )						MACH NO.			
		$\alpha$		$\delta C$	$\delta E$	$\delta A$	$\delta F$		-5	0	5							
RMB100	B23	A		-	-	-	-	2	5	4						10.4		
200	B22			-	-	-	-		7	6								
205	B22W19			-	0	0	0		9	8								
220	B22C8			-60	-	-	-		25	24								
225	B22C8W19				0	0	0		27	26								
125	B23C8W19								29	28								
226	B22C8W19				10				31	30								
224					-10				33	32								
223					-20				35	34								
222					-40				37	36								
215				-65	0				45	44								
245				-30					47	46								
265				0					50	49								
285				30					52	51								
227		B		-60		10		3	39	38	40							
228					-10				42	41	43							
240	B22C8	A		-30	-	-	-	2	19	18								
260				0	-	-	-		21	20								
280				30	-	-	-		23	22								
202	B22W19			-	-40	0	0		11	10								

1 7 13 19 25 31 37 43 49 55 61 67 7576  
q(P.S.F.) | MACH | CN | CA | CLM | CBL | CYN | CY | BETA | 8

COEFFICIENTS:

$\alpha$  or  $\beta$

SCHEDULES

IDPVAR(1) IDPVAR(2) NDV

NASA-MSFC-MAF

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TEST CFHT 70 DATA SET/RUN NUMBER  
COLLATION SUMMARY

2 of 2

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER		CONFIGURATION	SCHD.	PARAMETERS/VALUES				NO. of RUNS	NOMINAL SIDESLIP ( $\beta$ )								MACH NO.			
			$\alpha$		$\delta_C$	$\delta_E$	$\delta_A$		$\delta_F$	-5	0	5								
RMB204		B22W19	A		-	-10	0	0	2	15	14							10.4		
206		↓	↓		-	10		↓	↓	17	16									
325		B22C8W19F7L	B		-60	0		20	3	54	53	55								
525		↓	↓					60	↓	57	56	58								
425			↓					40	↓	60	59	61								
625		B22C8W19F7LFR	A					40	2	63	62									
725		B22C8W19F8L	B					20	3	65	64	66								
925		↓	↓					60	↓	68	67	69								
825			↓					40	↓	71	70	72								
A25		B22C8W19F8LF8R	A		↓	↓		40	2	74	73									
203		B22W19	↓		-	-20		0		13	12									
246		B22C8W19			-30	10				76	75									
244		↓	↓			-10				78	77									
243			↓				-20				80	79								
242			↓			↓	-40				82	81								
B65		B22C8W19R4	C		0	0				87	86									
O65		B22C8W19V10	↓		↓	↓		↓		91	90									
D65		B22C8W19	↓		↓	↓	↓	↓		89	88									
RR1		B22	A		-	-	-	-	↓	84	83									

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
g. (PS.F) M.A. CH. ICN. ICA. ICLM. CBL. CYN. CY. BETA 8

COEFFICIENTS:

$\alpha$  or  $\beta$

SCHEDULES

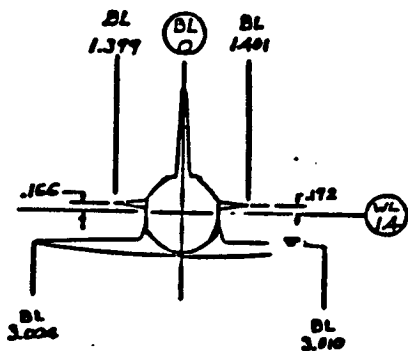
IDPVAR(1) IDPVAR(2) NDV

DELTA WING BOOSTER  
GD/C  
DR#1156 A-1- 424

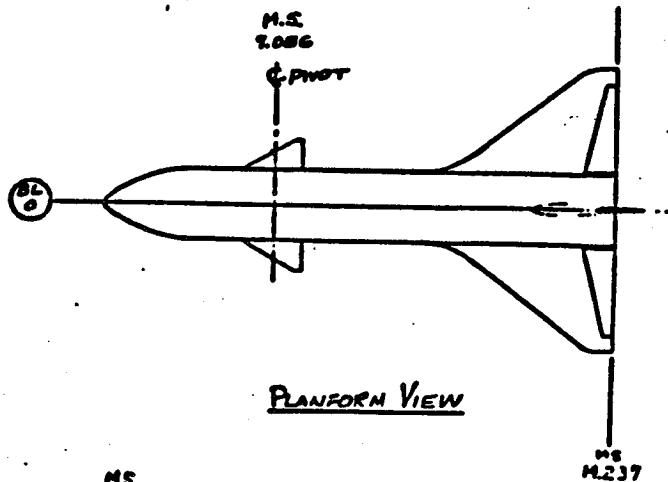
# MODEL THREE-VIEW

MEASURED DIMENSIONS

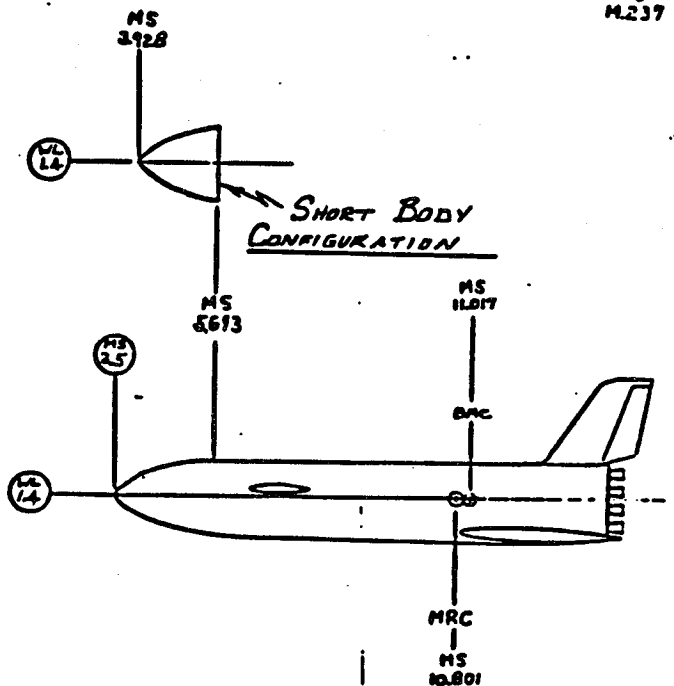
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View Looking Aft



PLANFORM VIEW

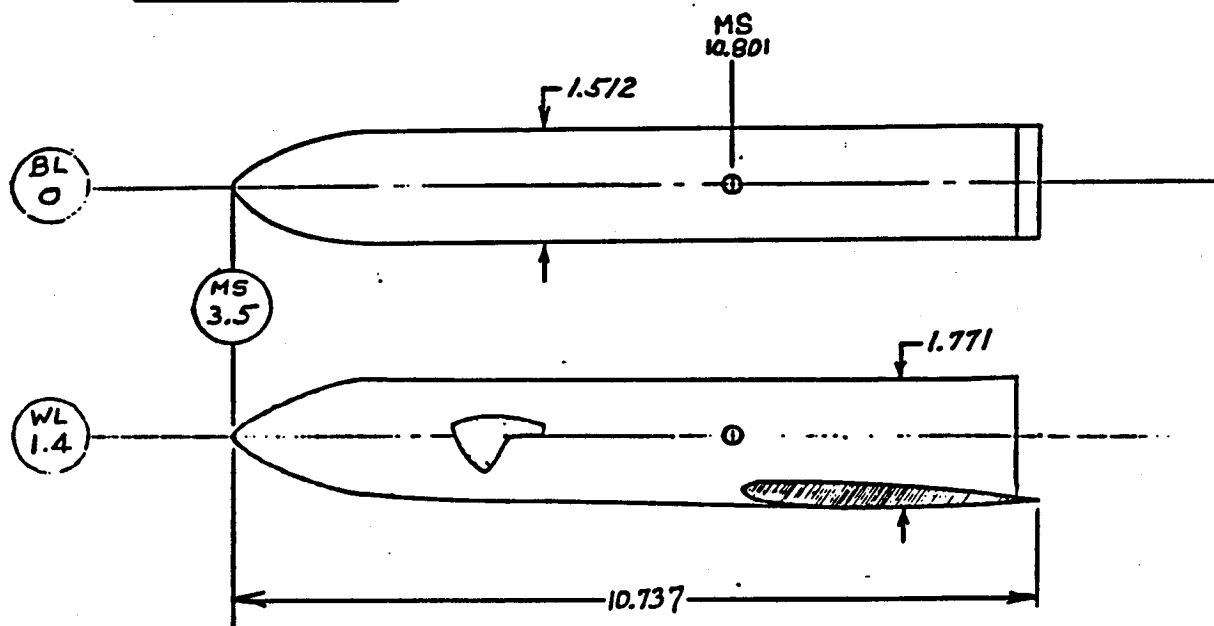


BASIC CONFIGURATION

NOTE: THIS TEST WILL BE CONDUCTED WITH  
THE VERTICAL REMOVED.

Figure 6. Basic Configuration

BODY-B<sub>22</sub> MEASURED DIMENSIONS



BODY-B<sub>23</sub>

SAME AS B<sub>22</sub> EXCEPT:  
LENGTH = 10.309  
NOSE AT M.S. 3.928

Figure 7. Body B<sub>22</sub> and B<sub>23</sub>

CANARD - C<sub>8</sub>

MEASURED DIMENSIONS

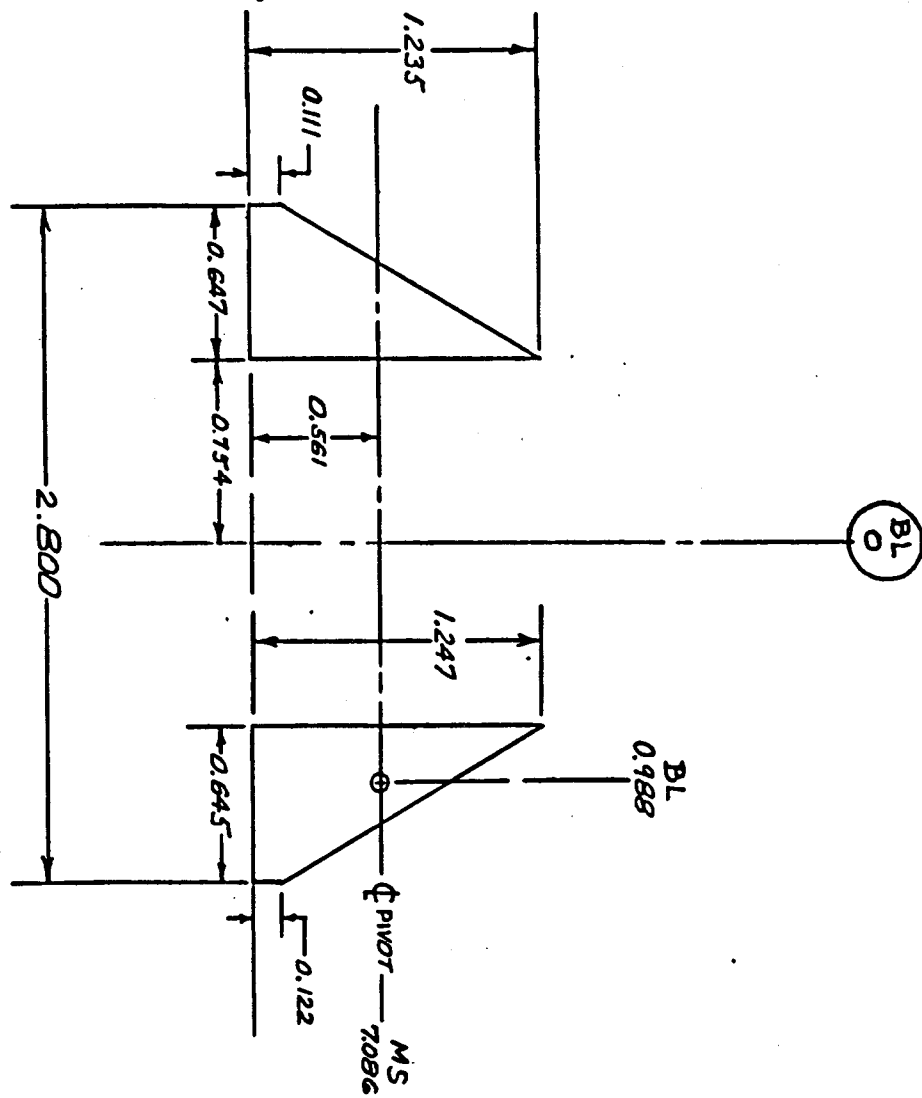


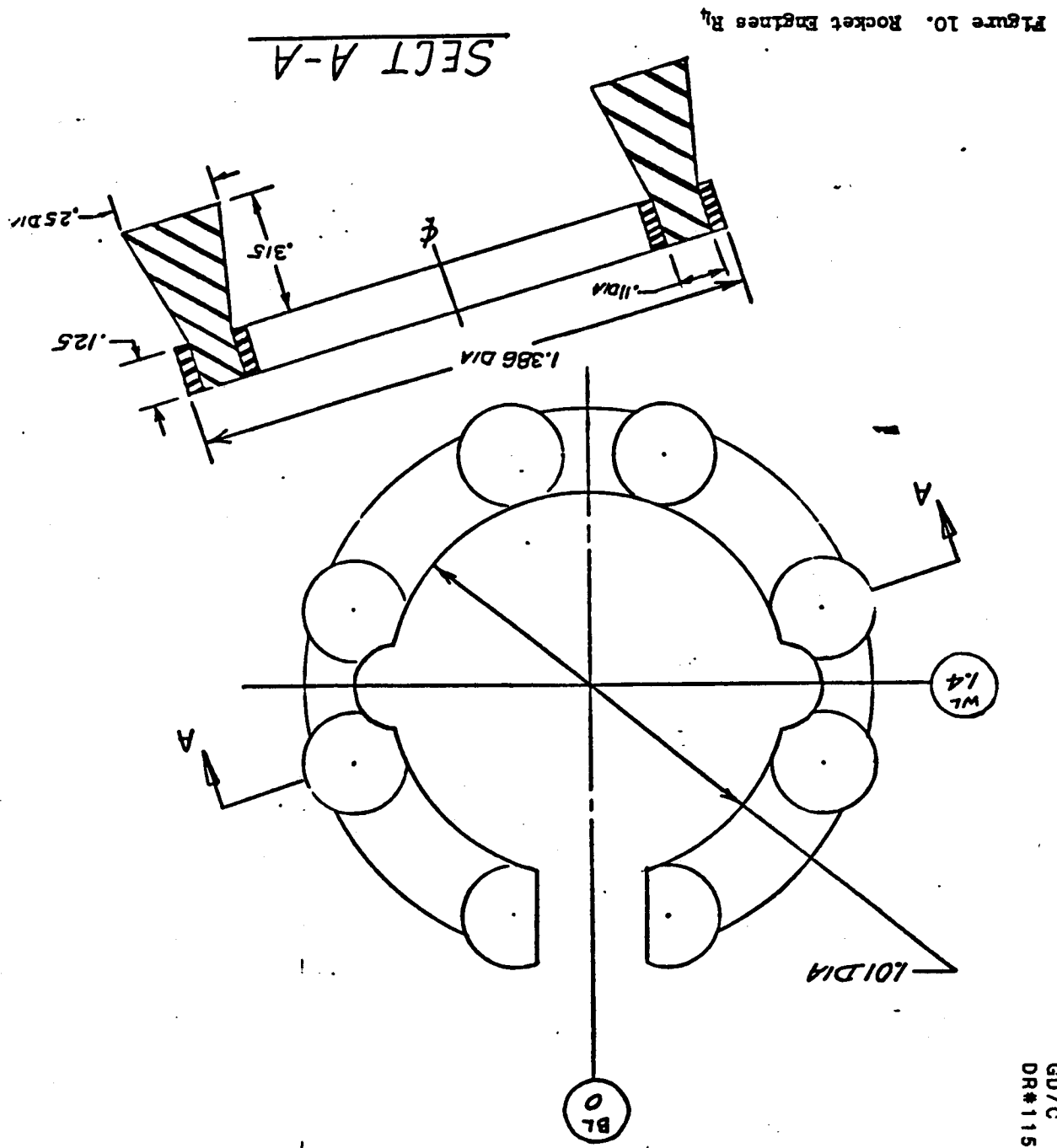
Figure 8. Canard - C<sub>8</sub>

DELTA WING BOOSTER  
GD/C  
DR#1156 A-1- 427



# ROCKET ENGINES - R<sub>4</sub>

DELTA WING BOOSTER  
GD/C  
DR#1156 A-1- 428



# WING - W<sub>19</sub>

MEASURED DIMENSIONS

DELTA WING BOOSTER  
GD/C  
DR#1156 A-1- 429

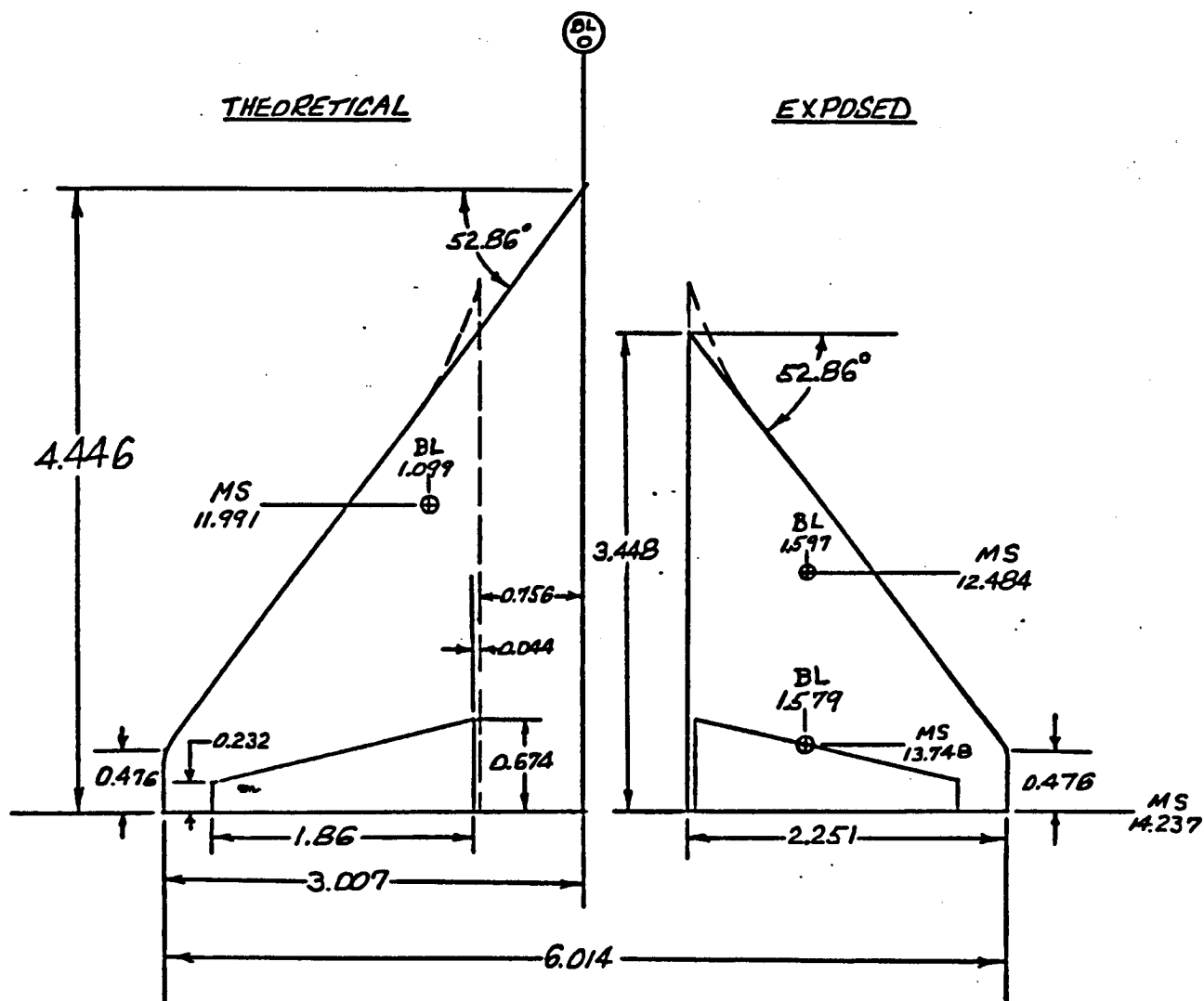


Figure 11. Wing W<sub>19</sub>



VENTRAL FLAP -  $F_7, F_8$   
FLAP PIVOTS DOWN FROM  
WING LOWER SURFACE

$F_8$	$F_7$	
.667	.471	
$\frac{A}{B}$	$\frac{.561}{.795}$	

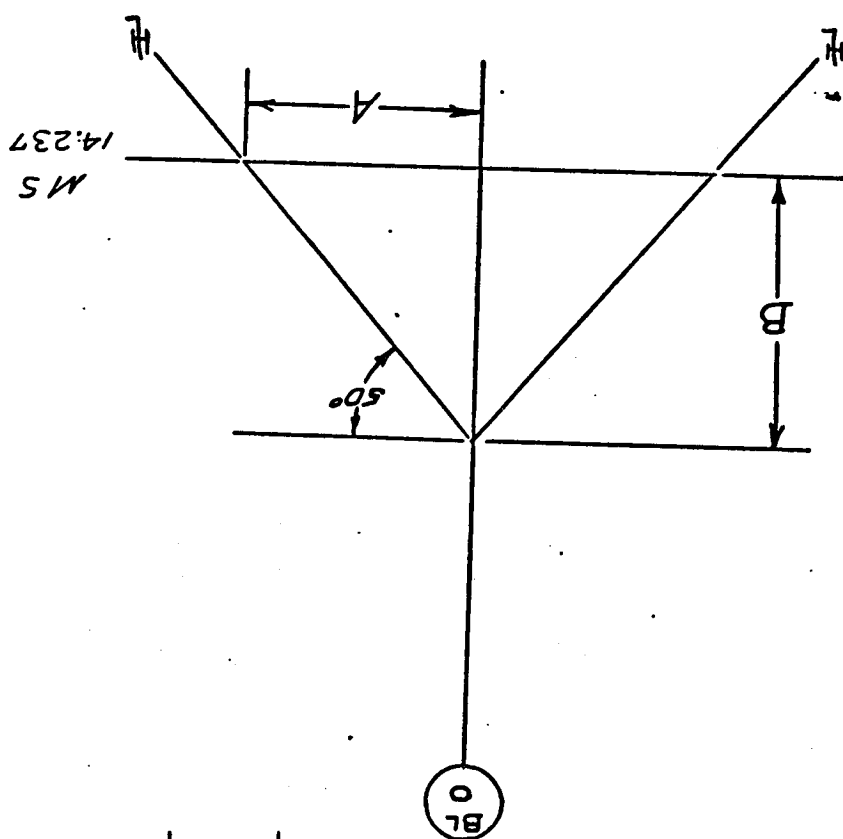


Figure 12. Ventral Flap -  $F_7, F_8$

TABLE II. TEST GDLSWT 603-0 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)															
		$\alpha$	$\beta$	$\delta C$	$\delta e_L$	$\delta e_R$	$\delta R$		0.20															
RD6 024	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub>	A	0	0	+5	+5	0	1	24															
025		A	5	0	+5	+5	0	1	25															
026		A	0	0	+10	+10	0	1	26															
027		A	5	0	+10	+10	0	1	27															
028		A	0	0	-5	-5	0	1	28															
029		A	5	0	-5	-5	0	1	29															
030		A	0	0	-10	-10	0	1	30															
031		A	5	0	-10	-10	0	1	31															
032		A	0	0	+10	-10	0	1	32															
033		A	5	0	+10	-10	0	1	33															
042	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub> X <sub>7</sub>	A	0	0	0	0	0	1	42															
043	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub>	A	0	0	0	0	0	1	43															
044	B <sub>30</sub> W <sub>23</sub> V <sub>14</sub> E <sub>38</sub>	A	0	-	0	0	0	1	44															
045		A	5	-	0	0	0	1	45															
046	B <sub>30</sub> W <sub>23</sub> C <sub>11</sub> V <sub>14</sub> E <sub>38</sub>	A	0	0	0	0	0	1	46															
047		A	5	0	0	0	0	1	47															
048		A	0	10	0	0	0	1	48															
049		A	5	10	0	0	0	1	49															
050		A	0	-10	0	0	0	1	50															
051		A	5	-10	0	0	0	1	51															

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
CL CY CD CSL CLM CLN CAF CAB CA CN 10

COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

$$\alpha A = -4 \text{ to } +24^\circ @ \Delta \alpha = 2^\circ$$

IDPVAR(1) IDPVAR(2) IDV

TABLE II. TEST GDLSWT-603-0 DATA SET COLLATION SHEET (CONTINUED)

DELTA WING BOOSTER

GD/C

DR#1223 A-1- 432

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)															
		A	B	$\delta_C$	$\delta_{CL}$	$\delta_{CR}$	$\delta_R$		0.201															
RD6001	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub> X <sub>5</sub>	A	0	0	0	0	0	1	1															
002	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub>	A	0	0	0	0	0	1	2															
003		A	5	0	0	0	0	1	3															
007		A	0	10	0	0	0	1	7															
008		A	5	10	0	0	0	1	8															
009		A	0	-10	0	0	0	1	9															
010		A	5	-10	0	0	0	1	10															
011		A	0	+15	0	0	0	1	11															
012		A	5	+15	0	0	0	1	12															
013		A	0	+20	0	0	0	1	13															
014		A	5	+20	0	0	0	1	14															
015	B <sub>31</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub>	A	0	0	0	0	0	1	15															
016		A	5	0	0	0	0	1	16															
017	B <sub>31</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub> X <sub>6</sub>	A	0	0	0	0	0	1	17															
018	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub>	A	0	-10	-10	-10	0	1	18															
019		A	5	-10	-10	-10	0	1	19															
020		A	0	+15	+10	+10	0	1	20															
021		A	5	+15	+10	+10	0	1	21															
022		A	0	+15	+5	+5	0	1	22															
023		A	5	+15	+5	+5	0	1	23															

1 7 13 19 25 31 37 43 49 55 61 67 75.75  
CL CY CD CSL CLM CLN CAF CAB CA CN 10

COEFFICIENTS:

" or "

SCHEDULES

$$\alpha_A = -4^\circ \text{ to } +24^\circ @ \Delta\alpha = 2^\circ$$

1DPVAR(1) 1DPVAR(2) NDV

NASA MSFC-WAF

TABLE II. TEST GDLSWT-603 DATA SET COLLATION SHEET (CONTINUED)

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)															
		$\alpha$	$\beta$	$\delta_c$	$\delta_{eL}$	$\delta_{eR}$	$\delta_R$		0.201															
RD6004	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>3B</sub>	0	B	0	0	0	0	1	4															
005		10	B	0	0	0	0	1	5															
006		15	B	0	0	0	0	1	6															
056	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> E <sub>3B</sub>	0	B	0	0	0	-	1	56															
057		10	B	0	0	0	-	1	57															
058		15	B	0	0	0	-	1	58															

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
CL CY CD CSL CLM CLN CAF CAB CA CN MACH BETA 10  
 COEFFICIENTS: \_\_\_\_\_ IDPVAR(1) IDPVAR(2) NDV

$\alpha$  or  $\beta$   
 SCHEDULES

$$\beta_R = -6 \text{ to } +10^\circ @ \Delta\beta = 2^\circ$$

NASA-MSFC-MAF

☐ PRETEST

☒ POSTTEST

[illegible]

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TABLE II. TEST GD4ST 603-0 DATA SET COLLATION SHEET (CONTINUED)

☐ PRETEST  
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)															
		a	B	$\delta_c$	$\delta_{CL}$	$\delta_{CR}$	$\delta_R$		0.201															
RD6052	B <sub>30</sub> W <sub>23</sub> C <sub>11</sub> V <sub>14</sub> E <sub>38</sub>	A	0	15	0	0	0	1	52															
053	↓	A	5	15	0	0	0	1	53															
054	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> E <sub>38</sub>	A	0	0	0	0	-	1	54															
055		A	5	0	0	0	-	1	55															
059		A	0	-10	0	0	-	1	59															
060		A	5	-10	0	0	-	1	60															
061		A	0	+10	0	0	-	1	61															
062		A	5	+10	0	0	-	1	62															
063		A	0	+15	0	0	-	1	63															
064	↓	A	5	+15	0	0	-	1	64															
065	B <sub>30</sub> W <sub>23</sub> E <sub>38</sub>	A	0	-	0	0	-	1	65															
066	↓	A	5	-	0	0	-	1	66															
067	B <sub>32</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub>	A	0	0	0	0	0	1	67															
068	↓	A	5	0	0	0	0	1	68															
069	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub>	A	0	0	0	0	0	1	69															
070	↓	A	5	0	0	0	0	1	70															
075	B <sub>30</sub> W <sub>23</sub> C <sub>10</sub> V <sub>14</sub> E <sub>38</sub>	A	0	0	0	0	0	1	75															
076	↓	A	0	0	0	0	0	1	76															
077	B <sub>30</sub> W <sub>23</sub> V <sub>14</sub>	A	0	0	0	0	0	1	77															
078	↓	A	5	0	0	0	0	1	78															

MODEL INVERTED

MODEL UPRIGHT - REPEAT RUN

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
CL CLY CD CSL CLM CLN CAF CAB CA CN 10

COEFFICIENTS:

a or b  
SCHEDULES

$\alpha = -4$  to  $+24^\circ$  @  $\Delta\alpha = 2^\circ$

→ IDPVAR(1) IDPVAR(2) NDV

NASA-MSFC-MAF

TABLE II. TEST 6DLST 603-0 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	PARAMETERS/VALUES	NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)
---------------------	---------------	-------	-------------------	-------------	--

ED6079	B30W23 V6	A 0	- 0 0 0	1	79
080	↑	A 5	- 0 0 0	1	80
081	B30W23 C10 V6	A 0	0 0 0	1	81
082	↑	A 5	0 0 0	1	82
083	B30 C10	A 0	0 0 0	1	83
084	↑	A 5	0 0 0	1	84
085	↑	A 0	- 10 - 10	1	85
086	↑	A 5	- 10 - 10	1	86
087	↑	A 0	+ 10 + 10	1	87
088	↑	A 5	+ 10 + 10	1	88
089	↑	A 0	+ 15 + 15	1	89
090	↑	A 5	+ 15 + 15	1	90
091	B30 V4	A 0	- - -	1	91
092	↑	A 5	- - -	1	92
093	B30	A 0	- - -	1	93
094	↑	A 5	- - -	1	94
095	B32	A 0	- - -	1	95
096	↑	A 5	- - -	1	96

1	7	13	19	25	31	37	43	49	55	61	67	75.76
CL	CY	CD	CST	CLM	CLN	CAF	CAB	CA	CN			

COEFFICIENTS:  
a or B  
SCHEDULES

$$\alpha A = -4 \text{ to } +24^\circ @ \Delta \alpha = 2^\circ$$

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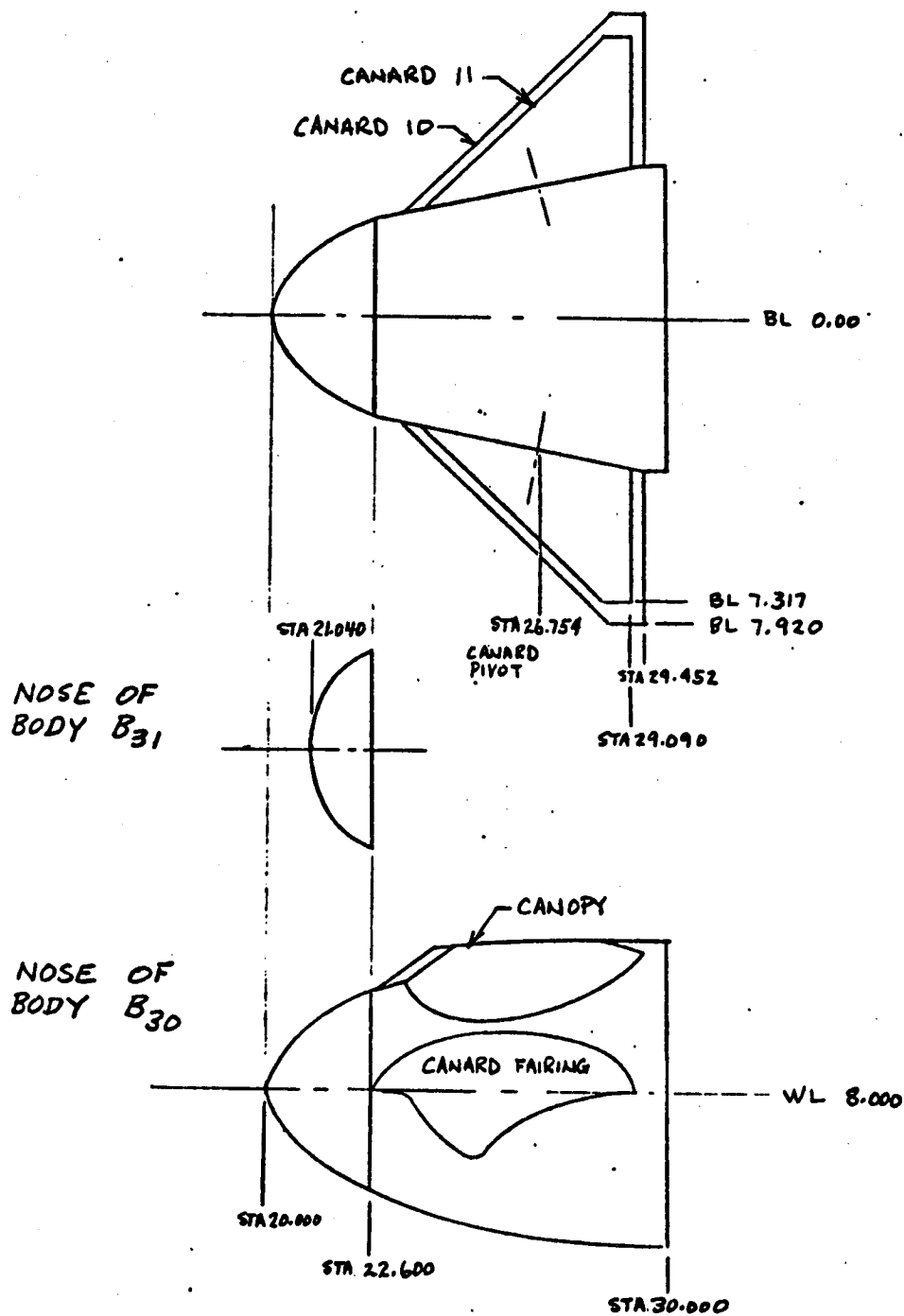


Figure 2. Nose of Body B30 and B31



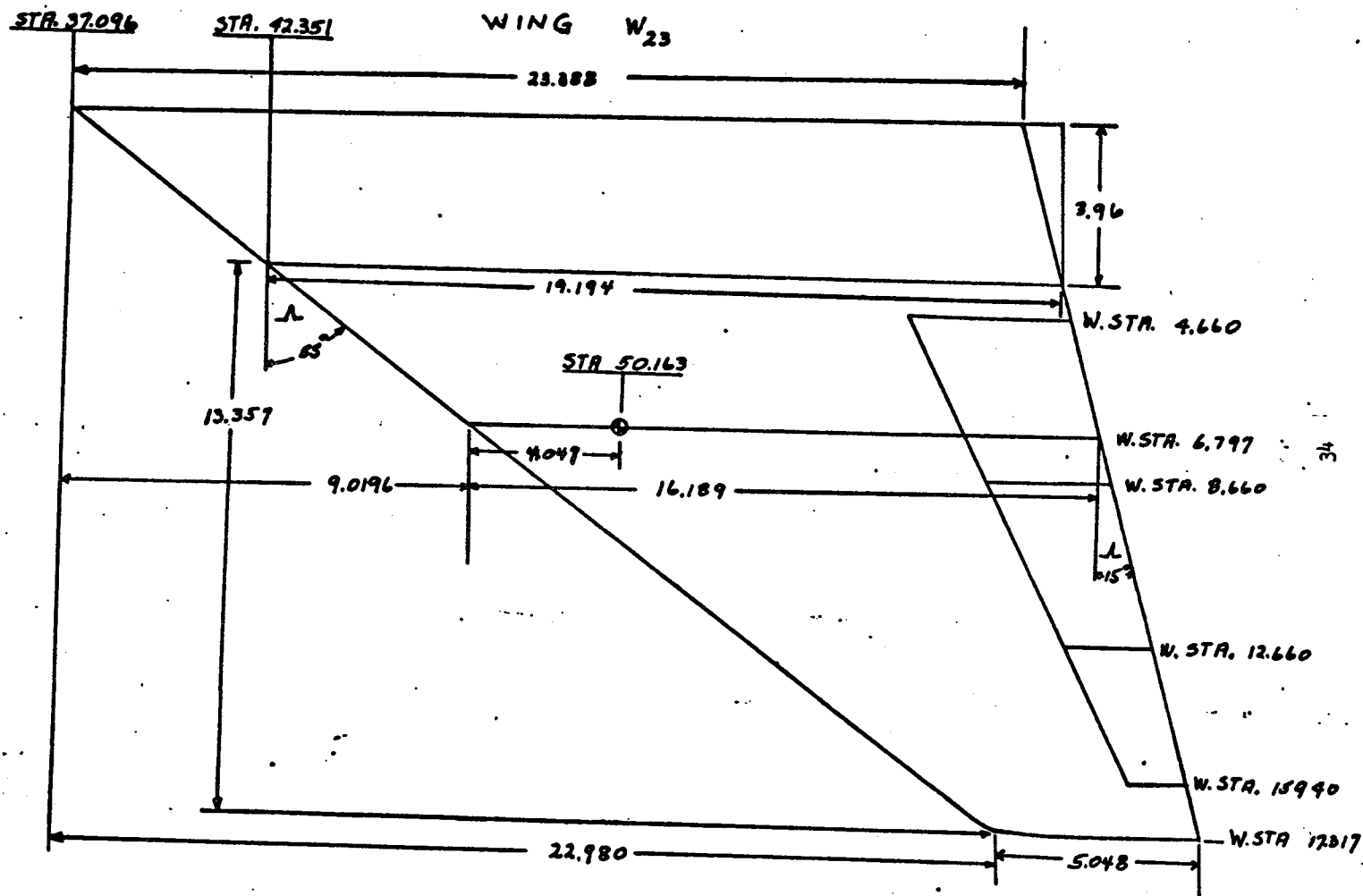


Figure 3. Wing W<sub>23</sub>

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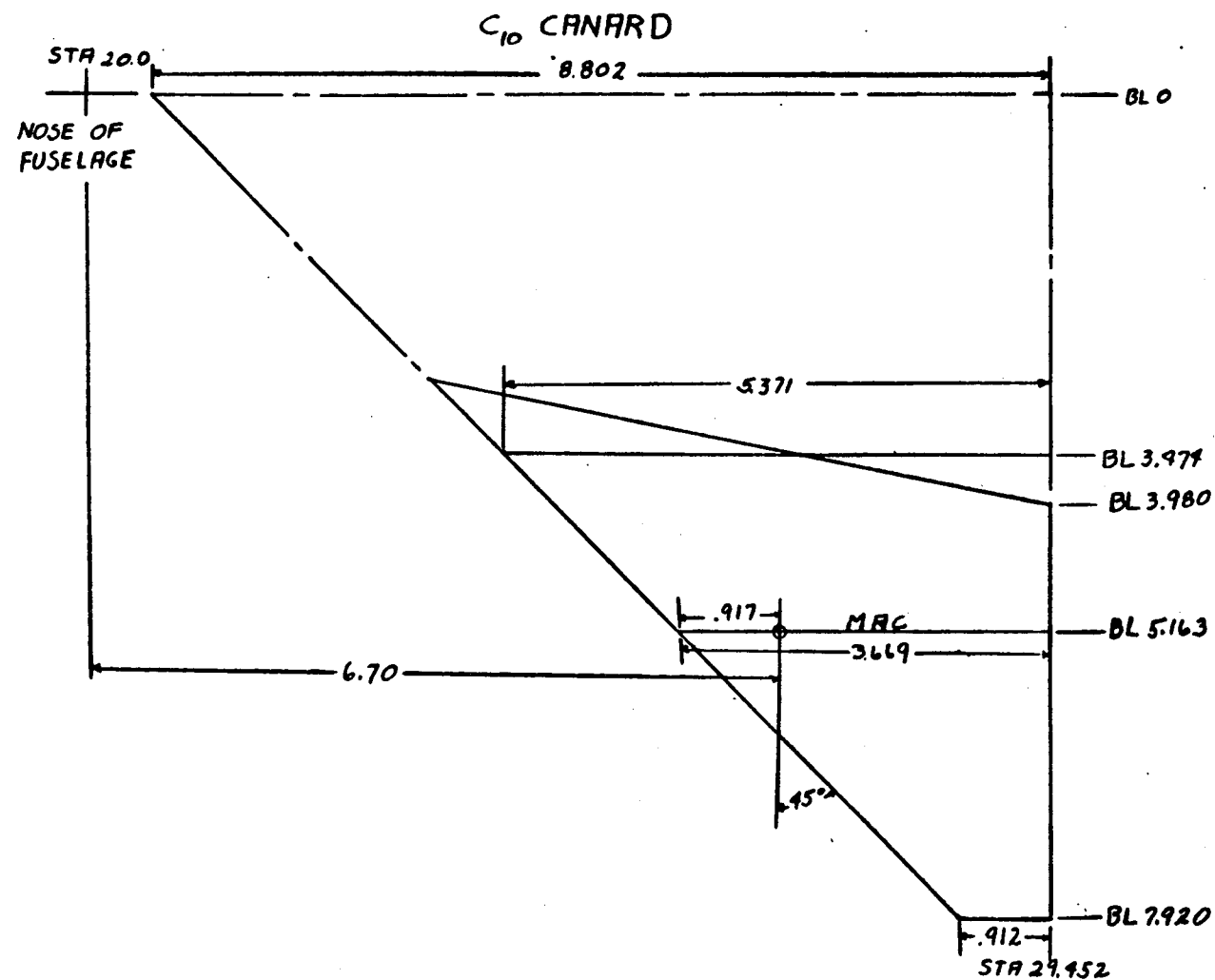


Figure 4. Canard  $C_{10}$

DELTA WING BOOSTER  
GD/C  
DR#1223 A-1- 439

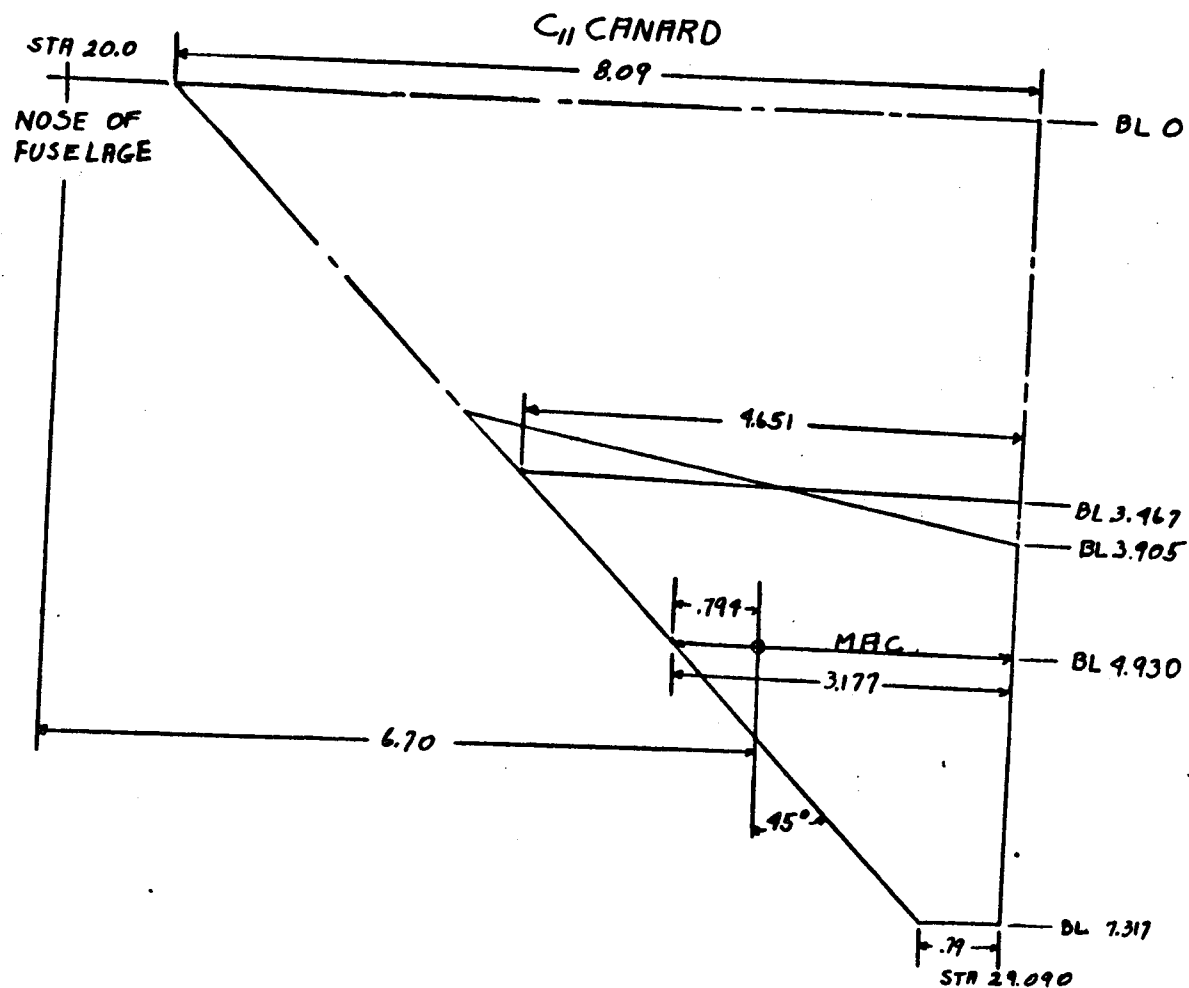


Figure 5. Canard C<sub>11</sub>

# VERTICAL TAIL $V_{14}$

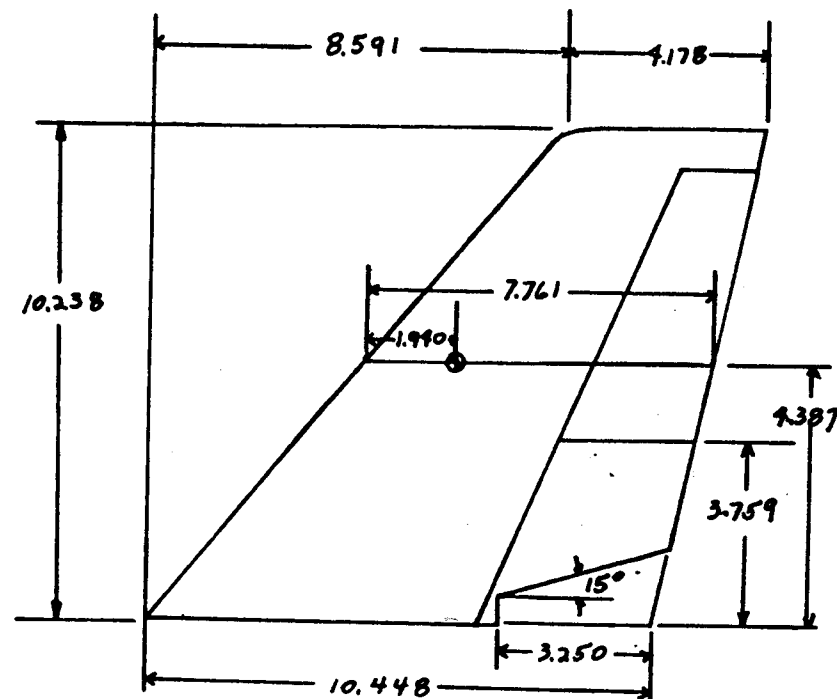
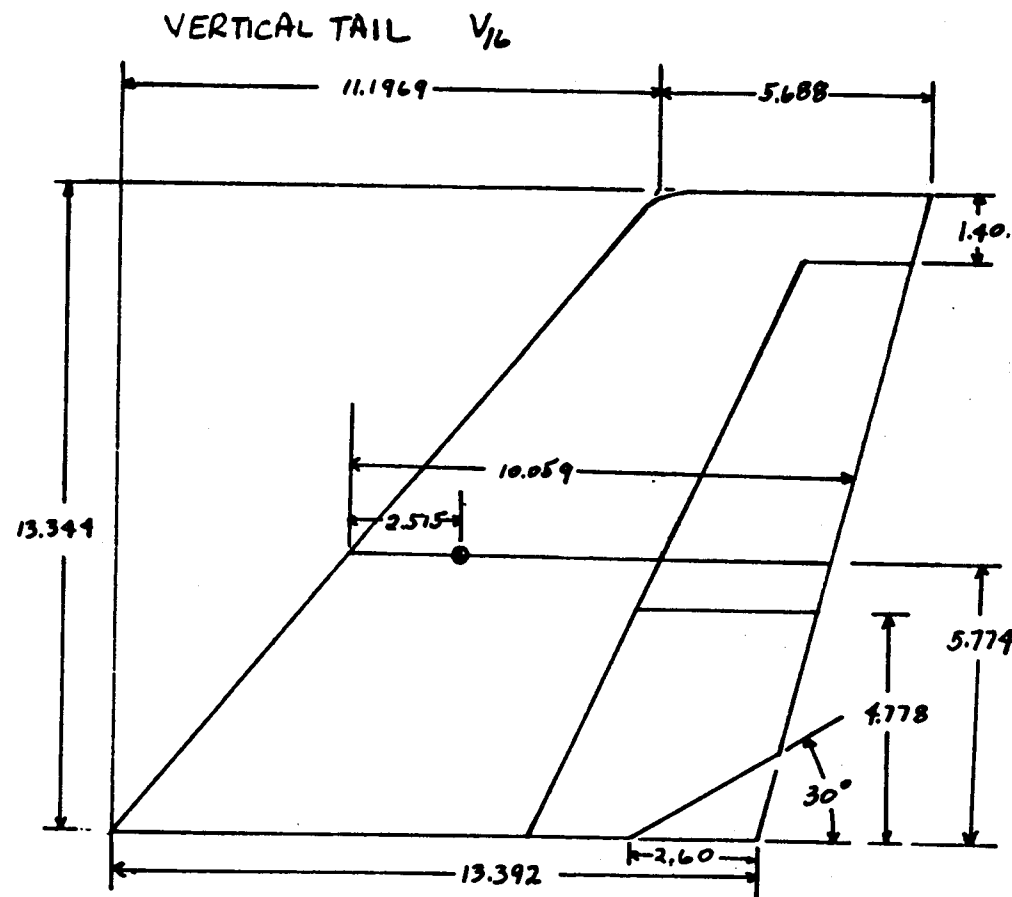


Figure 6. Vertical Tail  $V_{14}$



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Figure 7. Vertical Tail  $V_{16}$

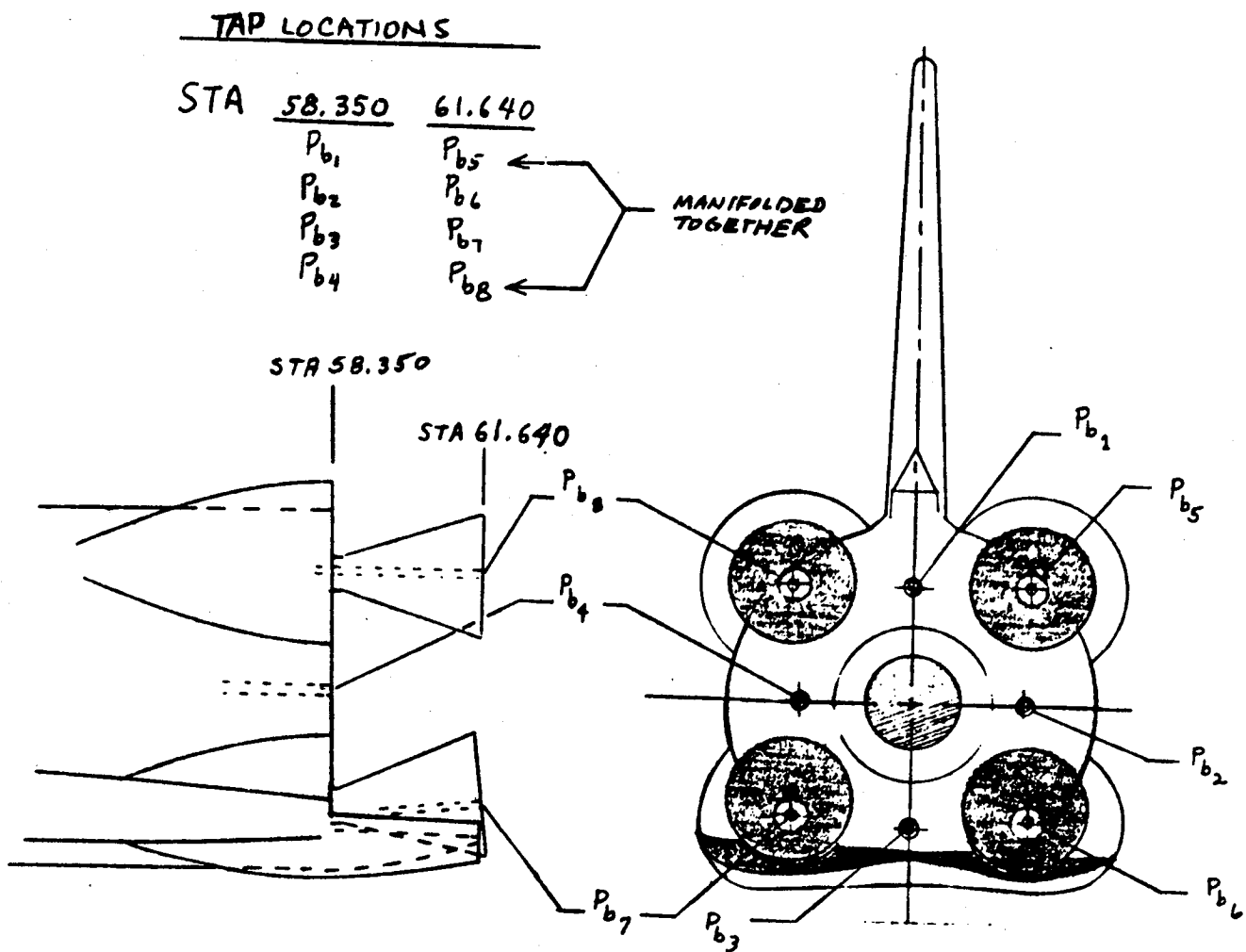
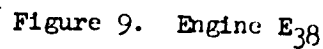
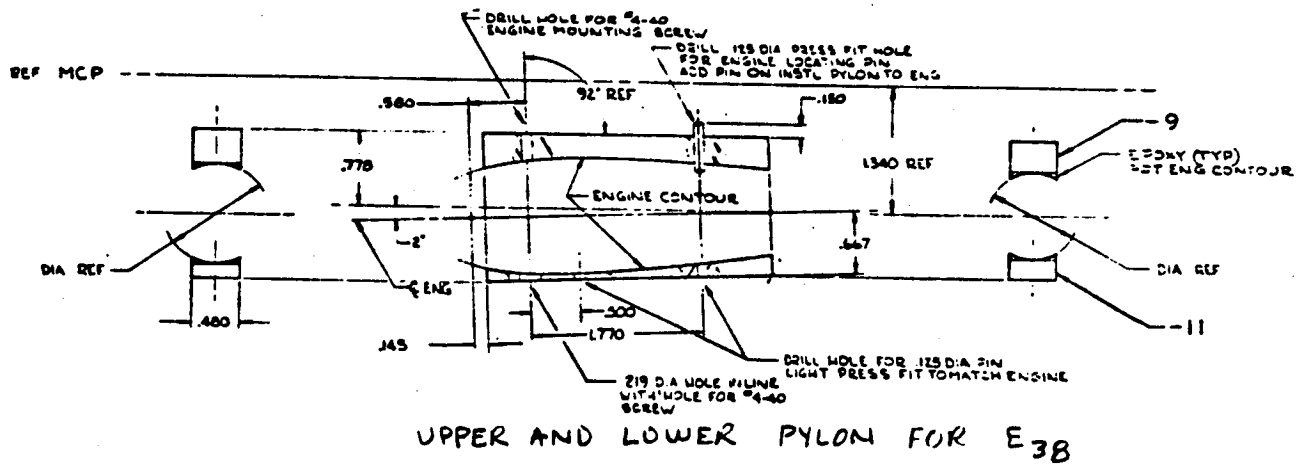


Figure 8. BASE REGION AND PRESSURE TAP LOCATIONS

DELTA WING BOOSTER  
GD/C  
DR#1223 A-1- 444



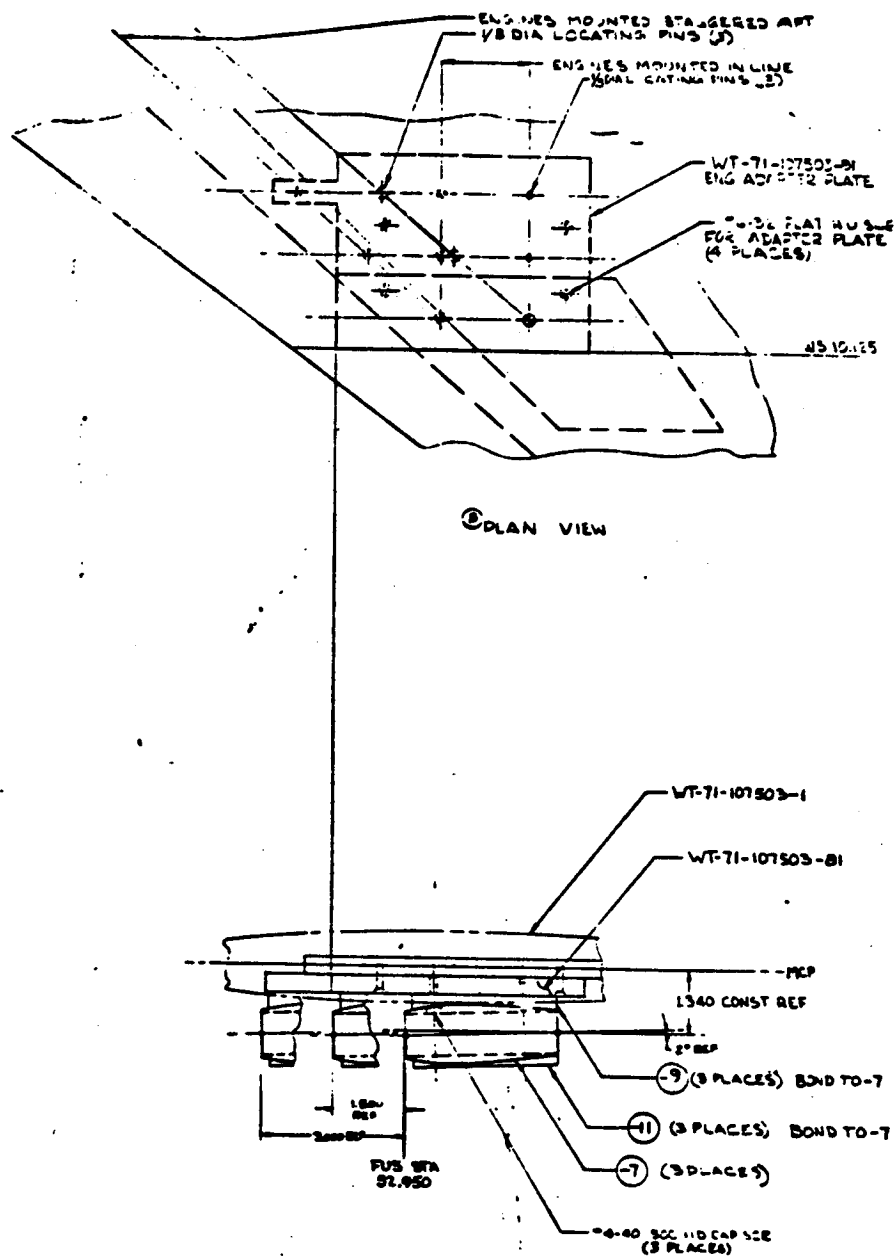
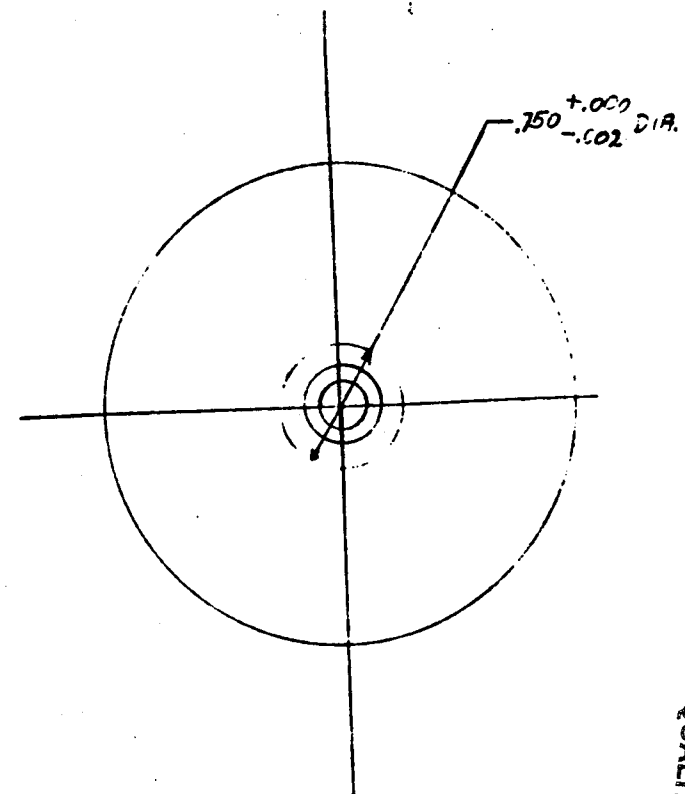
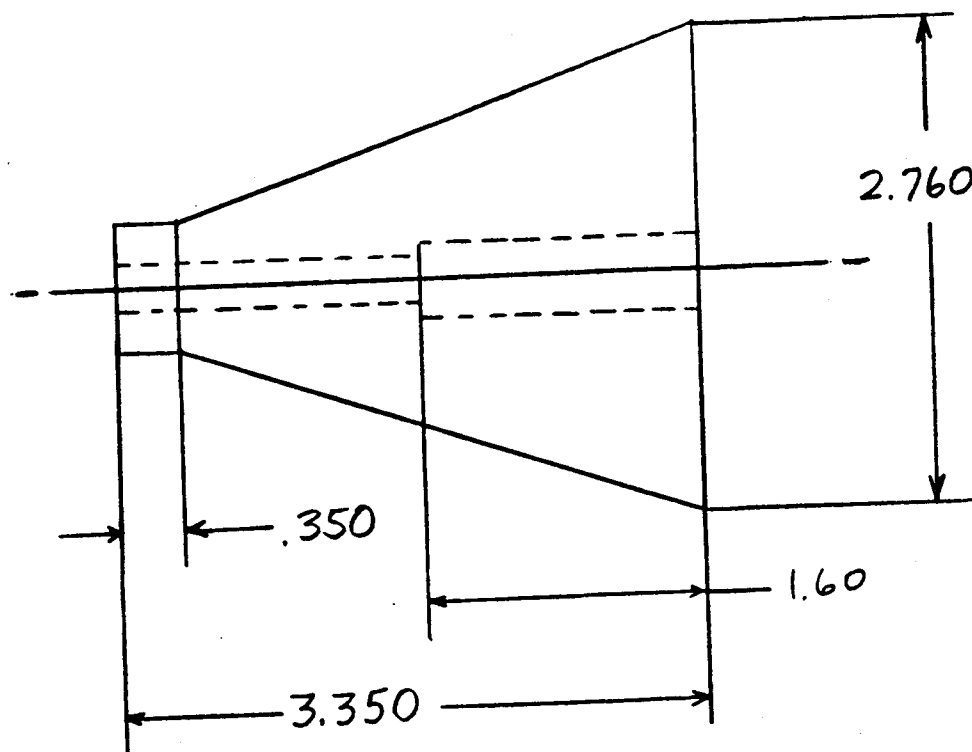


Figure 10. ENGINES ON WING



# ROCKET ENGINES $R_5$

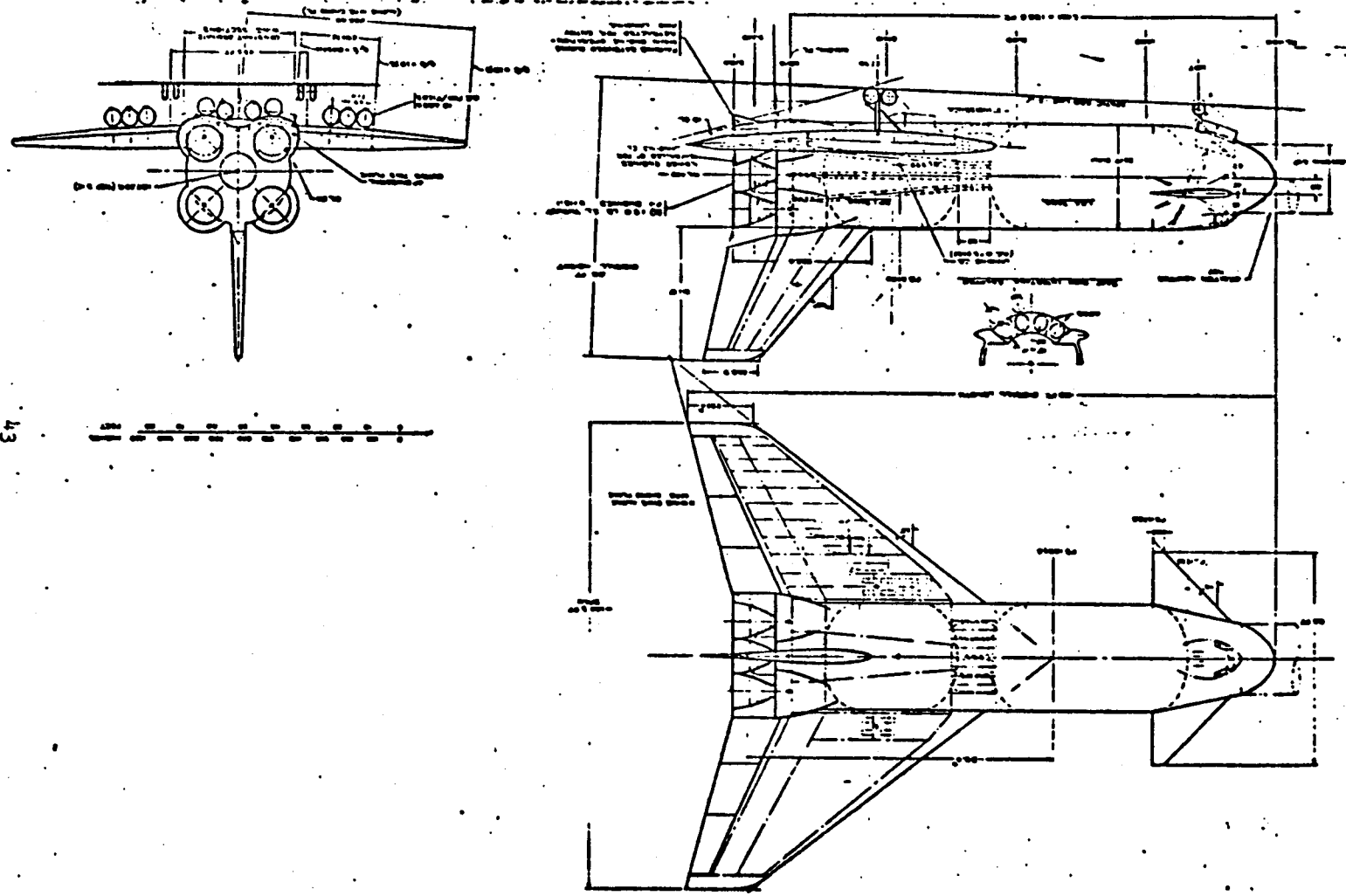


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Figure 11. Rocket Engine  $R_5$

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FIGURE 12. PREDESIGN OF THE B-1B3 BOOSTER



DELTA WING BOOSTER  
GD/C  
DR#1223 A-1-447

TEST DAC LSWT 1321 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS									
		$\alpha$	$\beta$	$\delta_e$	$\delta_{tr}$	$\delta_R$		0.18	0.20								
RC2072	BIWORIZ	A	0	0	0	0		19									
071	↓		-6					18									
032	BIWORIZKI		0					15									
031	↓		-6					3									
062	BIWO ZKI		0					16									
061	↓		-6					17									
012	BIWORIZKIVI		0					14									
011	↓		-6						1								
022	BIWORIZKIV2		0					5									
021	↓		-6					2									
027		B	0					10									
023		B	6					9									
024		.3	C					11									
025		.62	C					12									
026	↓	.63	D					13									
041	BIWORI KIV2	A	-6					4									
051	BIWORIZKIV2LIL2	A	-6	↓	↓	↓		7									

1 7 13 19 25 31 37 43 49 55 61 67 75.76  
CN CLM ICY ICYN ICB L CA CAF CL CDF L/D

COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

A =  $-6 \Delta 2^\circ \rightarrow 16$   
B =  $-15 - 14 \Delta 2^\circ \rightarrow 6$   
C =  $-6 \Delta 2^\circ \rightarrow 14$   
D =  $-14 \Delta 2^\circ \rightarrow 6$   
IDPVAR(1) IDPVAR(2) NDV

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DELTA WING BOOSTER  
MDAC  
DR#1014 A-1- 449

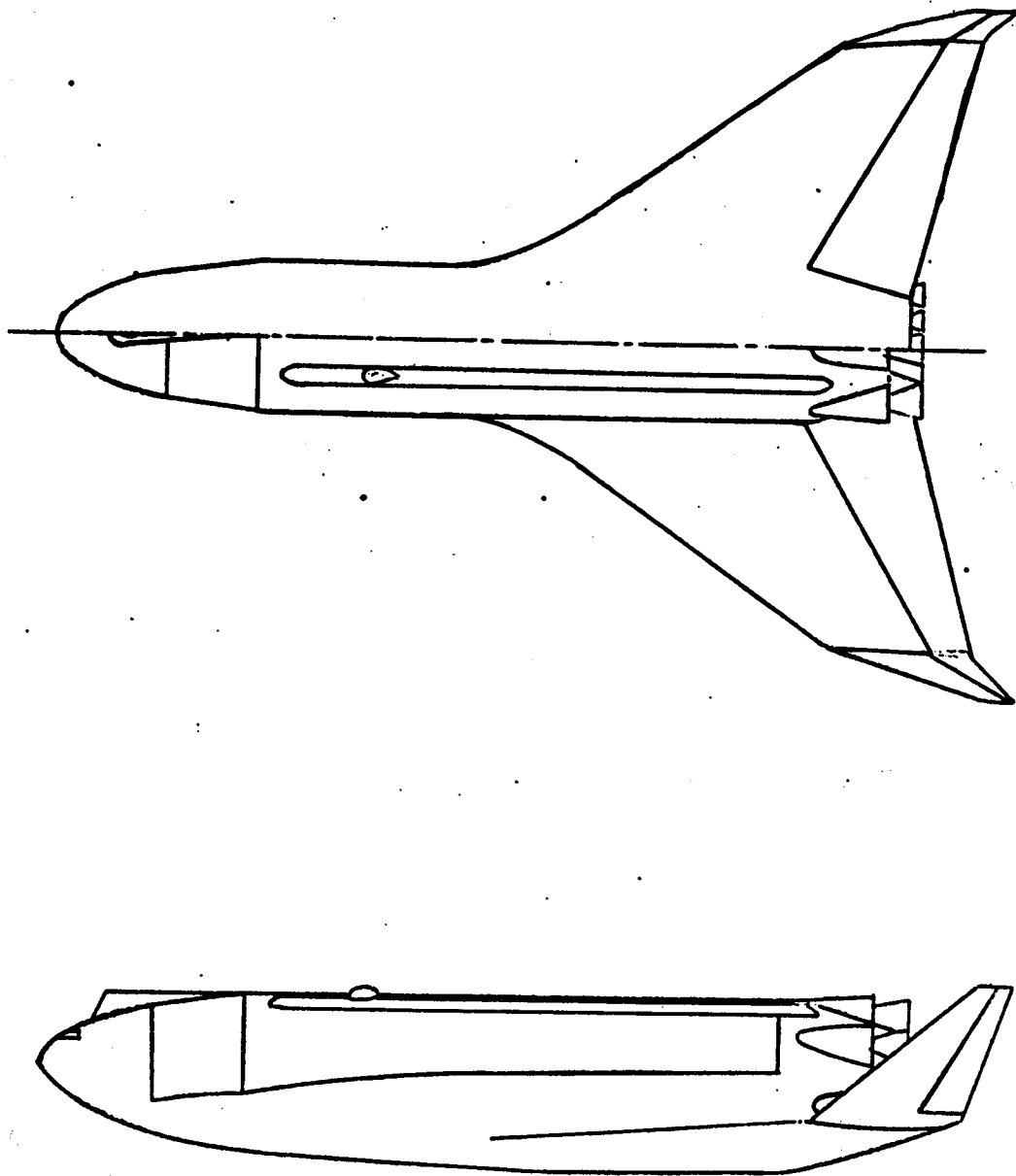


FIGURE 4. McDONNELL-DOUGLAS DELTA WING BOOSTER CONFIGURATION

DELTA WING BOOSTER  
MDAC  
DR#1014 A-1- 450

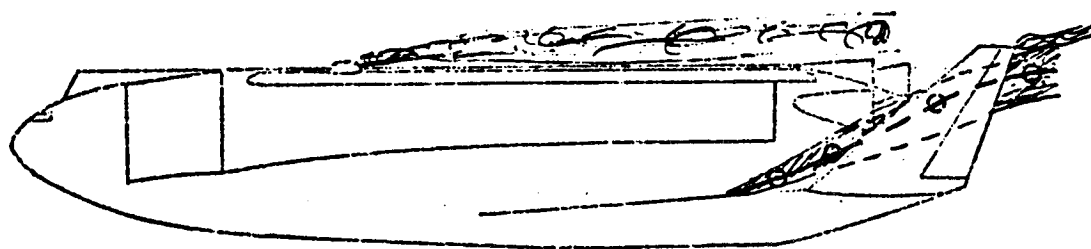
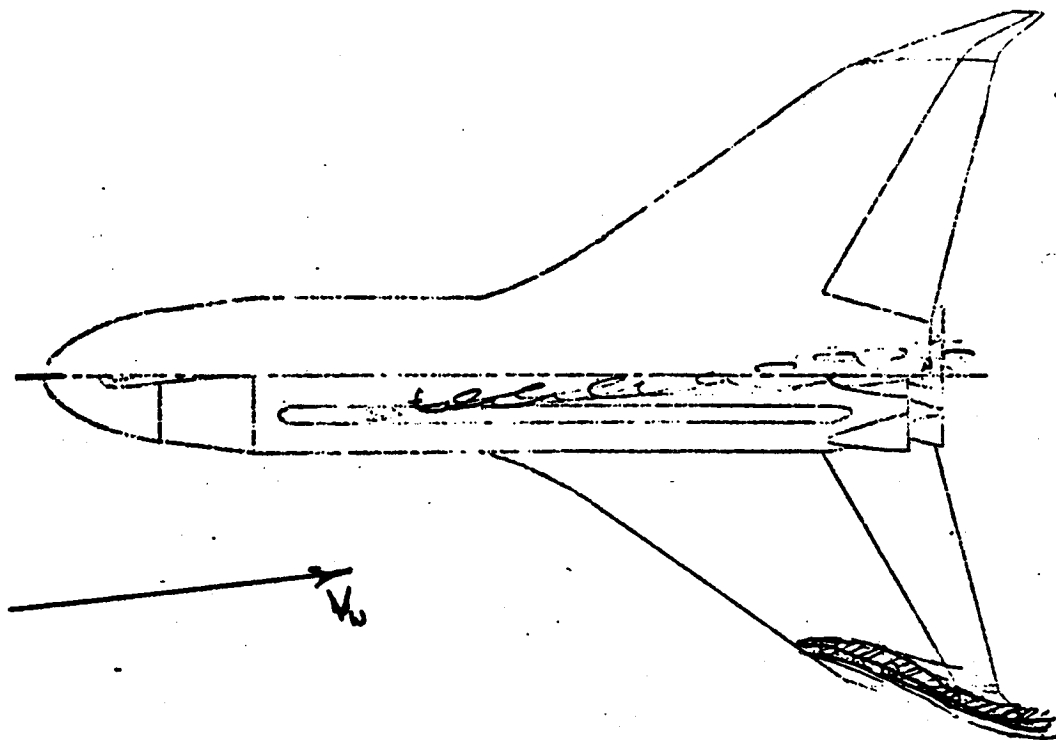


FIGURE 5. FLOWFIELD STUDIES CONFIGURATION  
 $B_1 W_0 V_2 K_1 R_1 Z$   $\alpha = 4.9^\circ$ ,  $\beta = -6^\circ$

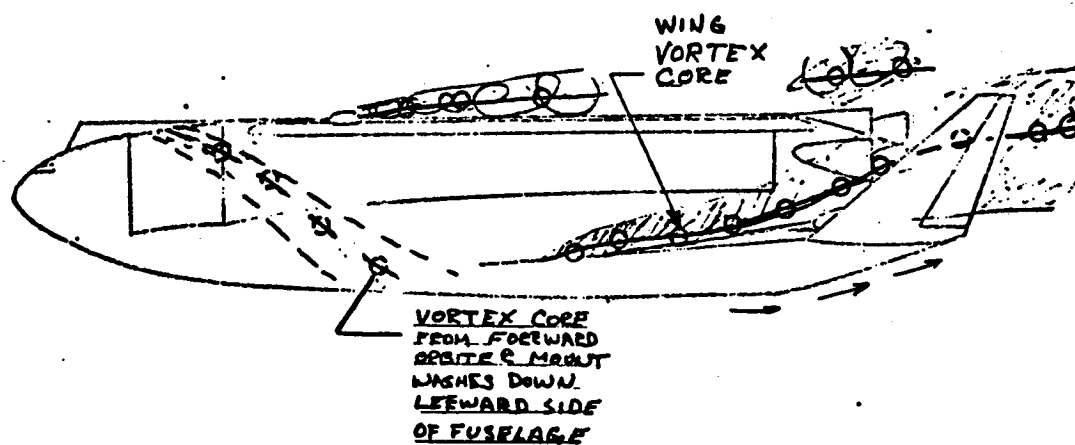
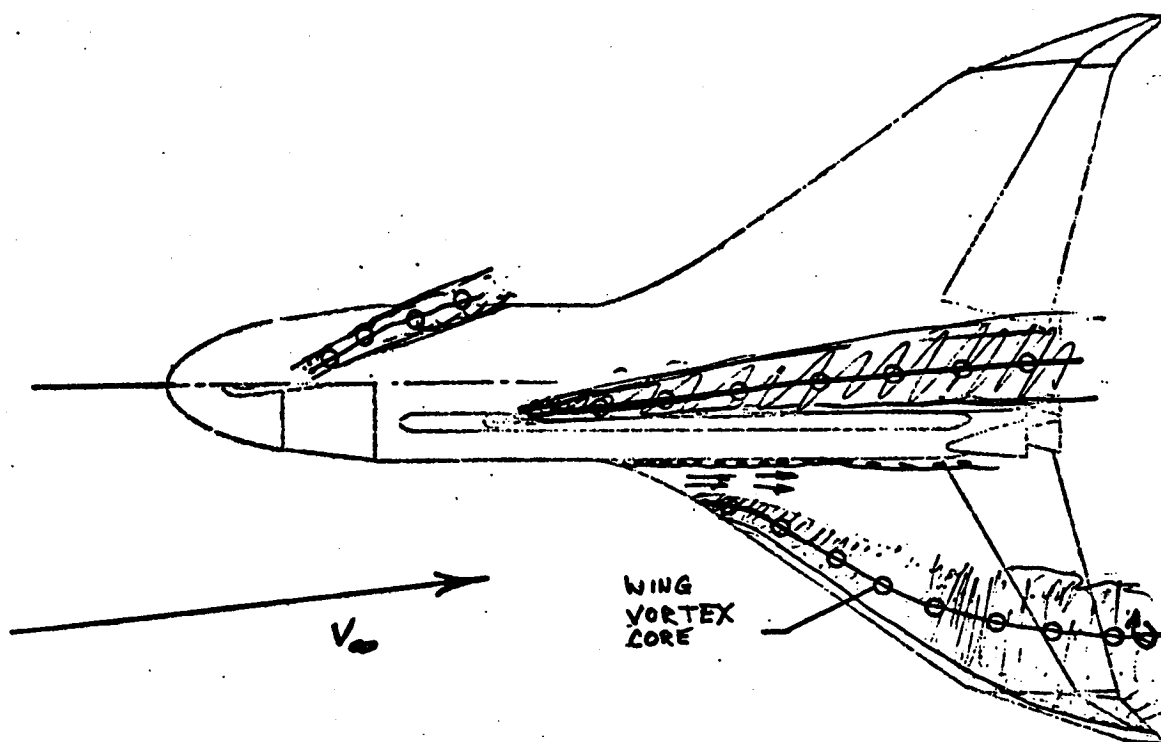
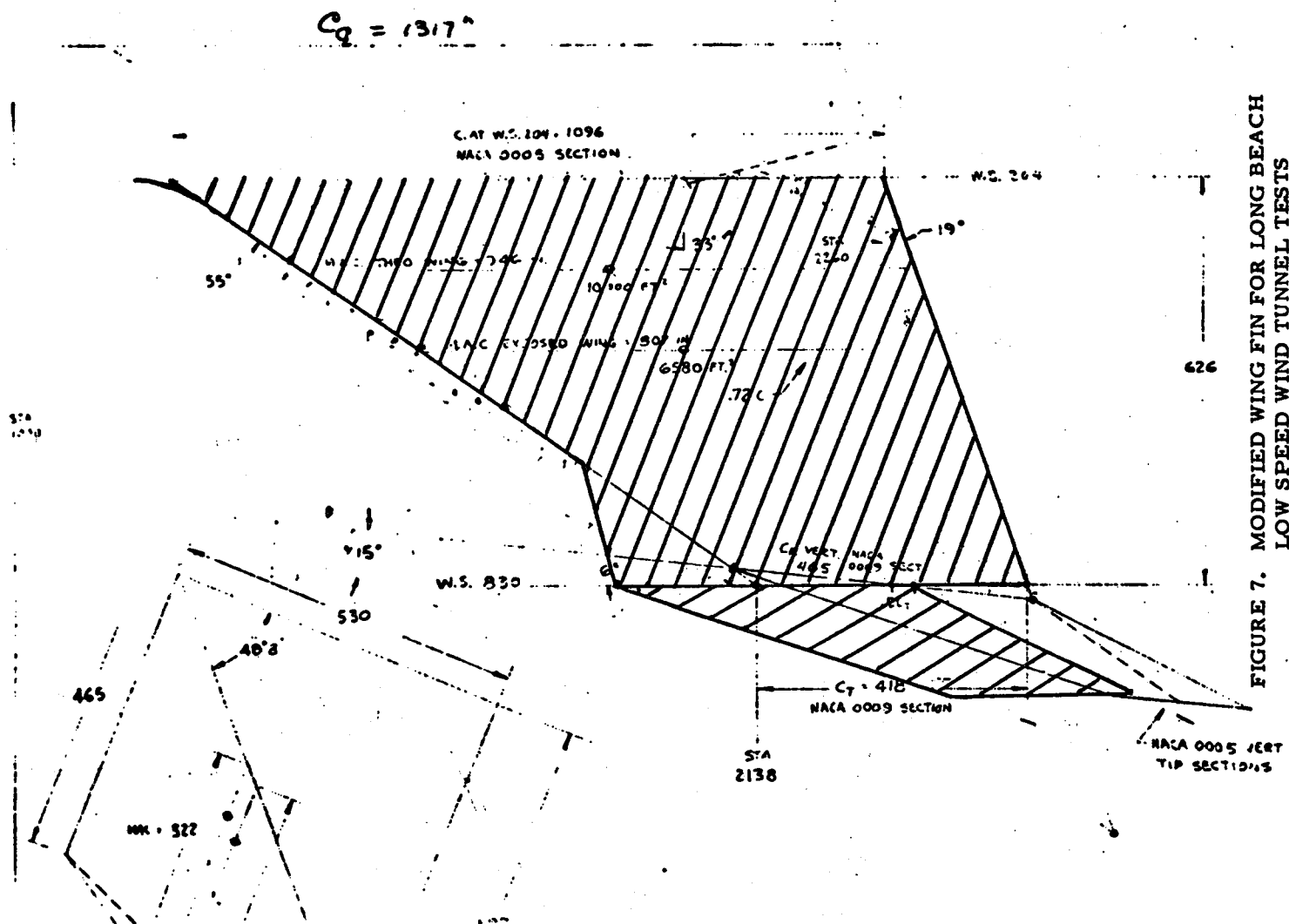


FIGURE 6. FLOWFIELD STUDIES CONFIGURATION  
 $B_1 W_0 V_2 K_1 R_1 Z \quad \alpha = 9.5^\circ, \quad \beta = -6^\circ$



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TEST M S F C 451 DATA SET COLLATION SHEET  
Force-MSFC Booster ( B-005 ) 0.0035 Scale Model AR 1164-I. Ground Plane and  
Grit Study.

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION					NO. of RUNS	MACH NUMBERS									
			a	B	8a	8c	8r	h/g	0.30	0.50	0.70	0.90	1.10	1.20	1.46	2.99	4.00	4.96
R19011	BWT/C <sup>2</sup> ERL	H	0	0	0	0	0	0	1	10								
R19021									1	11								
R19031									1	12								
R19041									1	13								
R19051									1	14								
R19061									1	15								
R19071									1	16								
R19081									1	17								
R19091									1	18								
R19101									1	19								
R19111									1	20								
R19121									1	21								
R19131									1	22								
R19141									1	23								
R19151									1	24								
R19161									1	25								
R19171									1	26								
R19181									1	27								
R19191									1	28								
R19201	BWT/C <sup>2</sup> ERL	H	0	0	0	0	0	0	1	29								

COEFFICIENTS:

CNM	CN	CYM	CY	CRL	ICN TO L/CN FOR EIGL	ICD	9
-----	----	-----	----	-----	----------------------	-----	---

a or B  
SCHEDULES

$\alpha A = -1 \text{ To } 14$	$\alpha D = -4 \text{ To } 8$
$\alpha B = -4 \text{ To } 14$	$\beta E = -1 \text{ To } 14 @ \alpha = 0^\circ$
$\alpha C = -10 \text{ To } 10$	$\beta F = -10 \text{ To } 10 @ \alpha = 6^\circ$

7. VERTICAL TIP FIL (SHORT VERSION)  
C. TRANSFERRED CHANNEL  
C. DELTA CHANNEL  
SHEET 1 of 6  
DELTA WING BOOSTER  
MSFC  
DR#1001 A-1-453

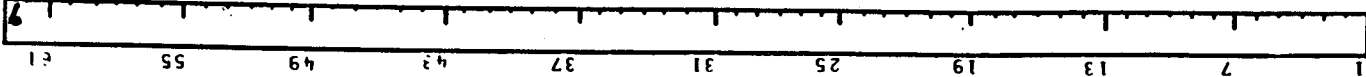


TEST MSFC 451 DATA SET COLLATION SHEET

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OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION	NO. OF RUNS	MACH NUMBERS
R19211	BWT' C <sup>2</sup> F R L	A	0	0	0.30 0.50 0.70 0.90 1.10 1.20 1.96 2.99 4.00 4.96
R19221		A	0	5	
R19231		A	0	5	
R19241		A	0	5	
R19251		A	0	10	
R19261		A	0	10	
R19271		A	0	10	
R19281		A	0	10	
R19291		A	0	15	
R19301		A	0	15	
R19311		A	0	15	
R19321		A	0	15	
R19331		A	0	0	
R19341		A	0	0	
R19351		A	0	0	
R19361		A	0	0	
R19371		A	0	5	
R19381		A	0	5	
R19391		A	0	5	
R19401	BWT' C <sup>2</sup> F R L	A	0	30	

COEFFICIENTS:



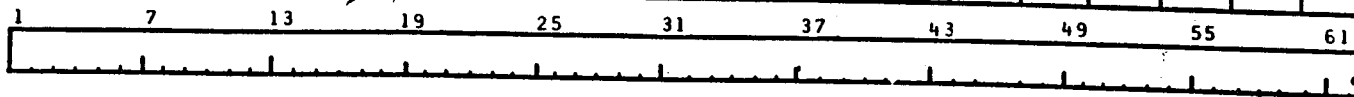
a or b  
SCHEDULES

$\alpha A = -1$ to $14$	$\alpha D = -4$ to $8$
$\alpha B = -1$ to $14$	$\alpha E = -1$ to $14$
$\alpha C = -10$ to $10$	$\alpha F = -10$ to $10$

TEST MSFC 451 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS									
		$\alpha$	$\beta$	$\delta_a$	$\delta_c$	$\delta_r$	$h/b$		0.30	0.50	0.70	0.90	1.10	1.20	1.96	2.99	4.00	4.96
R19411	BWT' C <sup>2</sup> E R L	A	0	0	10	0	.873	1	50									
R19421	↑	↑	↑	10	10	0	↑	1	51									
R19431	↑			20	10	0		1	52									
R19441	↑			30	10	0		1	53									
R19451	↑			0	15	0		1	54									
R19461	↑			10	15	0		1	55									
R19471	↑			20	15	0	↑	1	56									
R19481	↓	↑		30	15	0	.873	1	57									
R19491	BWT' C <sup>2</sup> E R L	A		30	0	0	.500	1	220									
R19502	BWT' C <sup>2</sup> E R	B		0	0	0	N/A	3	58	67	76							
R19512	↑	↑		10	0	0	↑	3	59	68	77							
R19522	↑			20	0	0		3	60	69	78							
R19532	↑			0	10	0		3	61	70	79							
R19542	↑			10	10	0		3	62	71	80							
R19552	↑			20	10	0		3	63	72	81							
R19562	↑			0	15	0		3	64	73	82							
R19572	↓			10	15	0		3	65	74	83							
R19582	BWT' C <sup>2</sup> E R			20	15	0		3	66	75	84							
R19592	BWT' E R	↑	↑	0	OFF	0	↑	4	85/1	88	91	94						
R19602	BWT' E R	B	0	10	OFF	0	N/A	4	86	89	92	95						

COEFFICIENTS:



$\alpha$  or  $\beta$   
SCHEDULES

$\alpha A = -1 \text{ TO } 14$        $\alpha D = -4 \text{ TO } 8$   
 $\alpha B = -4 \text{ TO } 14$        $\alpha E = -1 \text{ TO } 14$        $\theta \alpha = 0^\circ$   
 $\alpha C = -10 \text{ TO } 10$        $\alpha F = -10 \text{ TO } 10$        $\theta \alpha = 6^\circ$

NDV

DELTA WING BOOSTER  
MSFC  
DR#1001 A-1- 455

TEST MSFC 451 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION	NO. OF RUNS	MACH NUMBERS
R19612	BWT' E R	B	0.20 OFF	4	97/1 90 93 96
R19625		0	E 0	4	100 103 106 109
R19636		6	F 0	3	112 115 118
R19646		6	F 10	3	113 116 119
R19656	BWT' E R	6	F 20	3	114 117 120
R19665	BWT' E F R	0	E 0	4	124 125 126/127/1
R19676	BWT' E F R	6	F 0	4	128 129 130/1 131/1
R19684	BWT' E R CRUISE	D	0 0	3	221 225
R19694		1	1	3	222 227 228
R19704		0	0	3	223 228
R19714		0	0	3	224 229
R19724	BWT' E R CRUISE	0	0	3	239 238 237
R19734	BWT' E R	0	0	4	140
R19744		0	0	5	141
R19754		0	0	5	142
R19764		0	0	6	143
R19774		0	0	6	147/1 151
R19784		0	0	3	229
R19794		0	0	2	230 232
R19804	BWT' E R	D	0	6	231 236

COEFFICIENTS:



a or b  
SCHEDULES

$\alpha A = -1$  to  $14$   
 $\alpha D = -4$  to  $8$   
 $\beta E = -1$  to  $14$   $\theta d = 0$   
 $\beta F = -10$  to  $10$   $\theta d = 6$

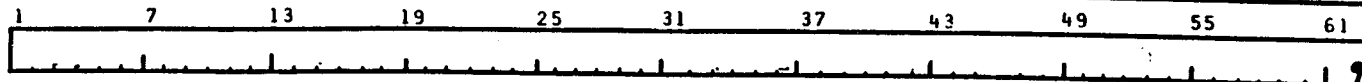
F = VENTRAL F.W.

NDV

TEST MSFC 451 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS									
		$\alpha$	$\beta$	$\delta_a$	$\delta_c$	$\delta_r$	$h/b$		0.30	0.50	0.70	0.90	1.10	1.20	1.96	2.99	4.00	4.96
R19811	BWT' C' ERL	A	0	10	10	0	.893	1	193									
R19821	↑	↑	↑	10	5	0	.893	1	194									
R19831				30	15	0	.893	1	195									
R19841				0	0	0	.350	1	196									
R19851				10	0	0	↑	1	197									
R19861				20	0	0		1	198									
R19871				30	0	0		1	199									
R19881				0	10	0		1	200									
R19891				10	10	0		1	201									
R19901				20	10	0	↑	1	202									
R19911				30	10	0	.350	1	203									
R19921				0	0	0	.500	1	204									
R19931				10	0	0	↑	1	205									
R19941				20	0	0		1	206									
R19951				30	0	0		1	207									
R19961				0	10	0		1	208									
R19971				10	10	0		1	209									
R19981				20	10	0	↑	1	210									
R19991	↓	↓	↓	30	10	0	.500	1	211									
R19A11	BWT' C' ERL	A	0	0	0	0	.893	1	212									

COEFFICIENTS:



$\alpha$  or  $\beta$   
SCHEDULES

$\alpha A = -1$  to  $14$        $\alpha D = -4$  to  $8$   
 $\alpha B = -4$  to  $14$        $\beta E = -1$  to  $14$        $\theta \alpha = 0^\circ$   
 $\alpha C = -10$  to  $10$        $\beta F = -10$  to  $10$        $\theta \alpha = 6^\circ$

NDV

DELTA WING BOOSTER  
MSFC  
DR#1001 A-1- 457

TEST MSFC 451 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	CONTROL DEFLECTION				NO. OF RUNS	MACH NUMBERS									
		$\alpha$ B	$\delta_c$	$\delta_e$	$\delta_r$	$\frac{1}{2}$		0.30	0.50	0.70	0.90	1.10	1.20	1.96	2.99	4.00	4.96

R19A21	BWT, C, ERL	A	0	10	0	0	.893	1	213									
R19A31			↓	20	0	0	↓	1	214									
R19A41			↑	30	0	0	↑	1	215									
R19A51			↑	0	10	0	↑	1	216									
R19A61			↑	10	10	0	↑	1	217									
R19A71			↑	20	10	0	↑	1	218									
R19A81	BWT, C, ERL	A	0	30	10	0	.893	1	219									



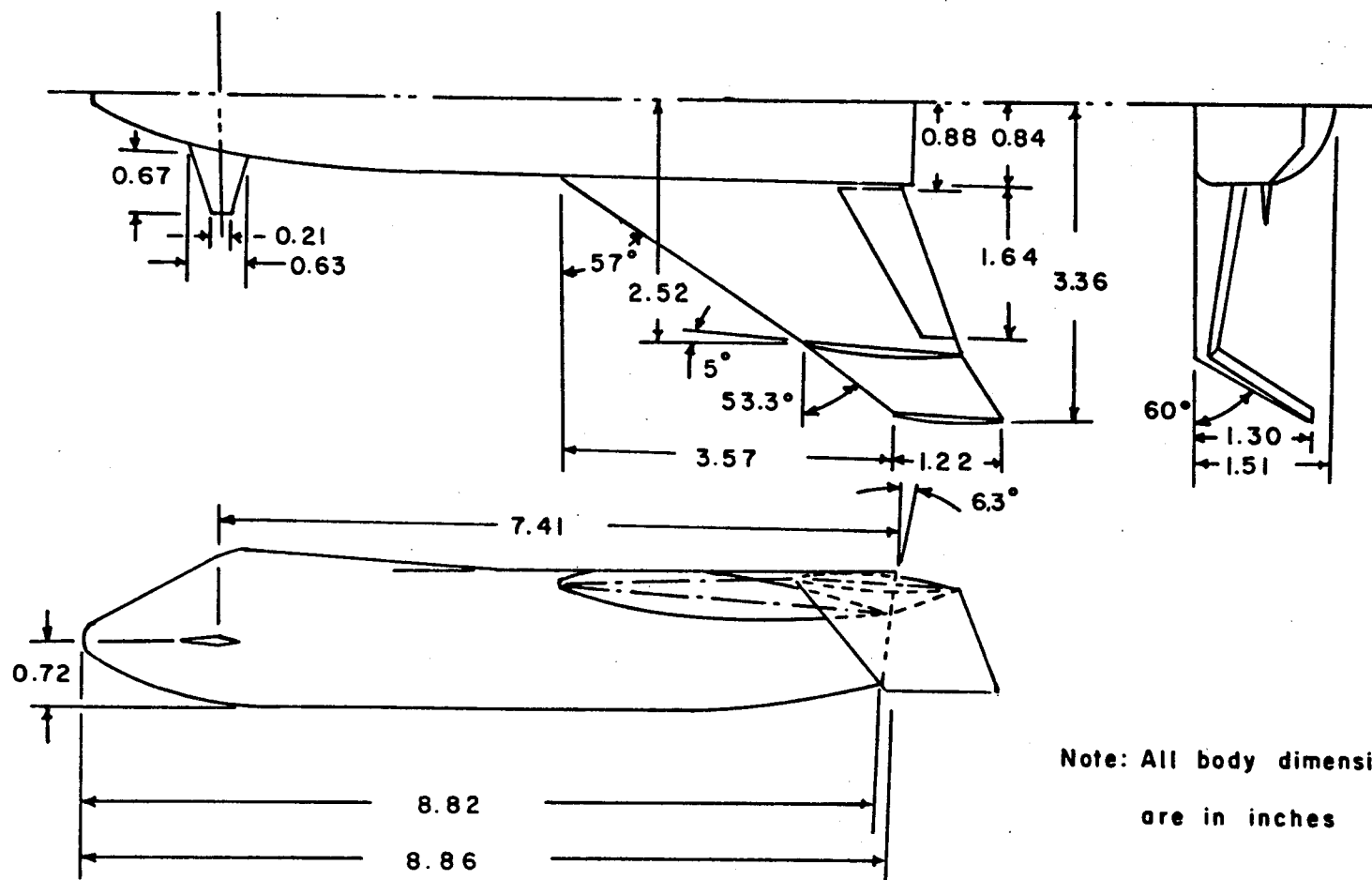
COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

$\alpha A = -1.70/14$	$\beta D = -4.70/8$
$\alpha B = -4.70/14$	$\beta E = -1.70/14$
$\alpha C = -10.70/10$	$\beta F = -10.70/10$

$\theta \alpha = 0^\circ$

$\theta \alpha = 0^\circ$



A 3-VIEW SKETCH OF THE MSFC 0.0035 SCALE BOOSTER MODEL

FIGURE 1

**PRETEST**

**POSTTEST**

MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)		TEMPERATURE		PRESSURE		DENSITY		SPEED OF SOUND		VISCOSITY		THERMAL CONDUCTIVITY		PRANDTL NUMBER		REYNOLDS NUMBER		MACH NUMBER	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

DATA SET IDENTIFIER		CONFIGURATION	SCHD.	PARAMETERS/VALUES					NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)		POSTTEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a	b			def	def	def	def																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</

**SCHEDULES**  
**8 20 0**

**COEFFICIENTS:**

$$\begin{aligned} \alpha A &= 0.2, 4.6, 8.10, 12.14, 16.18, 20 \\ \alpha M &= 20, 22, 23, 24, 25, 26, 28, 30, 32, 33, 34, 35, 36, 40 \\ \alpha K &= 40, 42, 44, 46, 48, 50, 52, 54, 55, 56, 58, 60 \\ \alpha B &= -6, -4, -2, 0, 2, 4, 6 \\ \beta C &= -6, -4, -2, 0, 2, 4, 6 \end{aligned}$$

TABLE II. (CONTINUED)  
TEST TWT #513 DATA SET COLLATION SHEET

SHEET 2 of 5.

☐ PRETEST  
☒ POSTTEST

POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)										
		$\alpha$	$\beta$	$\delta_{\alpha}$	$\delta_{\beta}$	$\delta_{\alpha}$	$\delta_{\beta}$		0.6		0.9				1.2		1.96	2.8	3.5
R5305A	$B_5^F W_{11} A F_2 S_1 V_7$	A	0°	0°	0°	±30°	0°		0.32%		0.33%				0.34%				
05M		M	✓													1.08%			
05K		K	✓															1.25%	
05G		10°	B						0.21%		0.21%				0.23%				
05H		15°	✓												0.27%				
05L		25°	✓																
06A	$B_5^E W_{11} A F_2 S_1 V_7 E_2$	A	0°						0.37%		0.36%				0.35%	0.90%			
06M		M	✓													1.10%			
06K		K	✓															1.21%	1.20%
06G		10°	B						0.23%						0.24%				
06H		15°	✓												0.26%				
06L		25°	✓																
22A		A	0°			0°										0.95%			
22G		10°	B						0.66%						0.38%				
22H		15°	✓												0.39%				
22L		25°	✓																
	$B_5^E W_{11} A V_7 S_1 V_7 E_2$	A	0°			±30°										0.94%			
14G		10°	B						0.61%										
		15°	✓																
14L		25°	✓																
																0.97%			

1	7	13	19	25	31	37	43	49	55	61	67	75.76
---	---	----	----	----	----	----	----	----	----	----	----	-------

COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

SEE SHEET #1

IDPVAR(1) IDPVAR(2) NDV

NASA-MSFC-MAP

DELTA WING BOOSTER  
TBC  
DR#1209 A-1- 461



TABLE II. (CONTINUED)

TEST TWT #513 DATA SET COLLATION SHEETDELTA WING BOOSTER  
TBC  
DR#1209 A-1- 482☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)										
		$\alpha$	$\beta$	$\delta_{EL}$	$\delta_{ER}$	$\delta_F$	$\delta_{FL}$		0.6		0.9				1.2		1.96	2.8	3.5
R5311G	B <sub>5</sub> <sup>E</sup> W <sub>11</sub> A <sub>F2</sub> S <sub>1</sub> E <sub>2</sub> V <sub>8</sub>	10°	B	0°	0°	±30°	0°		045%										
11H	↓	15°	✓											046%					
11L	↓	25°	✓													101%			
12A	B <sub>5</sub> <sup>E</sup> V <sub>11</sub> A <sub>F2</sub> S <sub>1</sub> E <sub>2</sub> V <sub>4</sub>	A	0°			0°			042%	043%				044%					
12M	↓	M	✓													115%			
12K	↓	K	✓															129%	130%
12G	↓	10°	B						041%										
12H	↓	15°	✓											040%					
12L	↓	25°	✓																
09A	B <sub>5</sub> <sup>E</sup> W <sub>11</sub> A <sub>F2</sub> S <sub>1</sub> V <sub>7</sub> E <sub>3</sub>	A	0°			±30°			058%	057%				056%		100%			
09M	↓	M	✓																
09K	↓	K	✓																
09G	↓	10°	B						053%	054%				055%				126%	127%
09H	↓	15°	✓											057%					
09L	↓	25°	✓																
10A	B <sub>5</sub> <sup>E</sup> W <sub>11</sub> A <sub>F2</sub> S <sub>1</sub> V <sub>7</sub> E <sub>4</sub> <sup>F</sup>	A	0°						059%	060%				061%		098%		128%	
10G	↓	10°	B						064%	063%				062%					
10H	↓	15°	✓											068%					
10L	↓	25°	✓																
																102%			

17576

17576

COEFFICIENTS:

 $\alpha$  or  $\beta$   
SCHEDULES

SEE SHEET #1

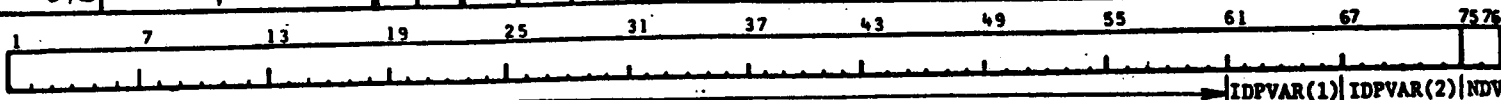
IDPVAR(1) IDPVAR(2) NDV

NASA-MSFC-WAF

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TEST TWT #513 DATA SET COLLATION SHEET☐ PRETEST☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		a	B	$\delta_{EL}$	$\delta_{ER}$	$\delta_r$	$\delta_{FL}$		0.6	0.9				1.2		1.96	2.8	3.5
R5313G	B <sub>5</sub> <sup>E</sup> W <sub>11</sub> <sup>A</sup> F <sub>2</sub> S <sub>1</sub> V <sub>7</sub> E <sub>4</sub> <sup>A</sup>	10°	B	0°	0°	±30°	0°		052%	051%				050%				
13H		15°	✓											049%				
13L		25°	✓												103%			
08A	B <sub>5</sub> <sup>E</sup> W <sub>11</sub> <sup>A</sup> F <sub>2</sub> S <sub>1</sub> V <sub>7</sub> E <sub>2</sub> C <sub>3</sub>	A	0°						019%					016%				
08M		M	✓												111%			
08K		K	✓															119%
08G		10°	B						080%					081%				
08H		15°	✓											082%				
08L		25°	✓												099%			
07M	B <sub>5</sub> <sup>E</sup> W <sub>11</sub> <sup>A</sup> F <sub>2</sub> S <sub>1</sub> V <sub>7</sub> E <sub>2</sub> C <sub>4</sub>	M	0°												113%			
07L	✓	25°	B												113%			
18A	B <sub>6</sub> W <sub>4</sub> <sup>A</sup> F <sub>2</sub> S <sub>1</sub> V <sub>7</sub> E <sub>2</sub>	A	0°						075%	076%				071%				
18M		M	✓												109%			
18K		K	✓														122%	123%
18G		10°	B						014%	013%				016%				
18H		15°	✓											017%				
18L		25°	✓												096%			
04G	B <sub>5</sub> <sup>E</sup> W <sub>11</sub> <sup>A</sup> F <sub>2</sub> S <sub>1</sub>	10°	✓						068%	069%				010%				
04H		15°	✓											011%				
04L		25°	✓												104%			



COEFFICIENTS:

a or B

SCHEDULES

SEE SHEET #1

NASA-MSFC-MAP

TABLE II. (CONCLUDED)  
 TEST TWT #513 DATA SET COLLATION SHEET

DELTA WING BOOSTER  
 TBC  
 DR#1209 A-1- 464

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		$\alpha$	$\beta$	$\delta_{CL}$	$\delta_{CR}$	$\delta_T$	$\delta_{FA}$		0.6	0.9				1.2	1.96	2.8	3.5	4.96
R5305C	B5 <sup>C</sup> W11 <sup>A</sup> F2S1V7	0°	C	0°	0°	±30°	0°		088/0					087/0				
05X	Y (TRISOFF)	✓	✓	✓	✓	✓	✓		089/0									
03L	B5 <sup>C</sup> S1	25°	B	—	—	—	—											
01A	B5	A	0°						085/0					086/0		116/0		
01M		M	✓															
01D		10°	C						084/0							118/0		
01H		15°	B											083/0				
01L		25°	✓	↓	↓	↓	↓									117/0		
27G	B5 <sup>C</sup> W11 <sup>A</sup> V10S1V7	10°	B	0°	0°	±30°	0°		065/0									

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS:

$\alpha$  or  $\beta$

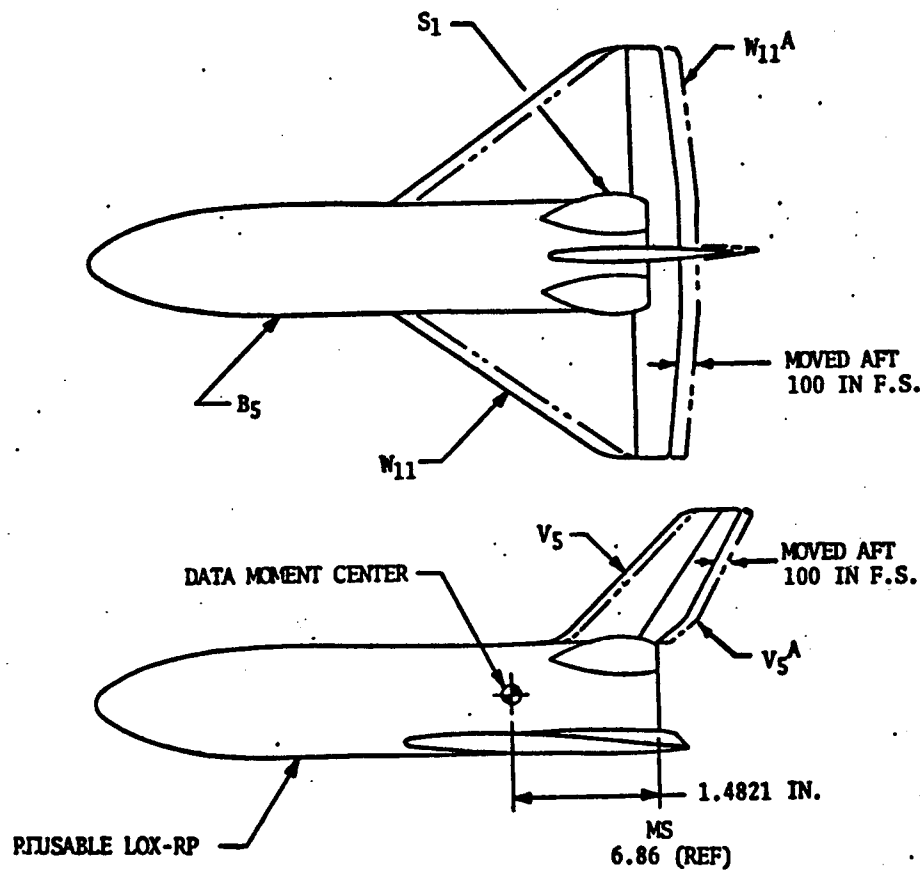
SCHEDULES

SEE SHEET #1

IDPVAR(1) IDPVAR(2) NDV

NASA-MSFC-WAF

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$S = 14.6836 \text{ sq.in. (9000 sq.ft.) } [W_{11}]$

$l_{\text{LONG}} = 4.508 \text{ in.}$

$l_{\text{LAT}} = 5.655$

$AR = 2.18$

$\lambda = 0.15$

$i_w = +2^\circ$

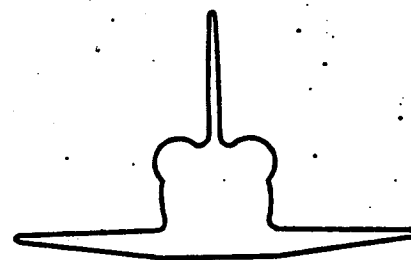


FIGURE 2. REUSABLE LOX-RP (-061) BOOSTER  
0.003366 SCALE AR 12161-2 MODEL

DELTA WING BOOSTER  
TBC  
DR#1209 A-1- 466

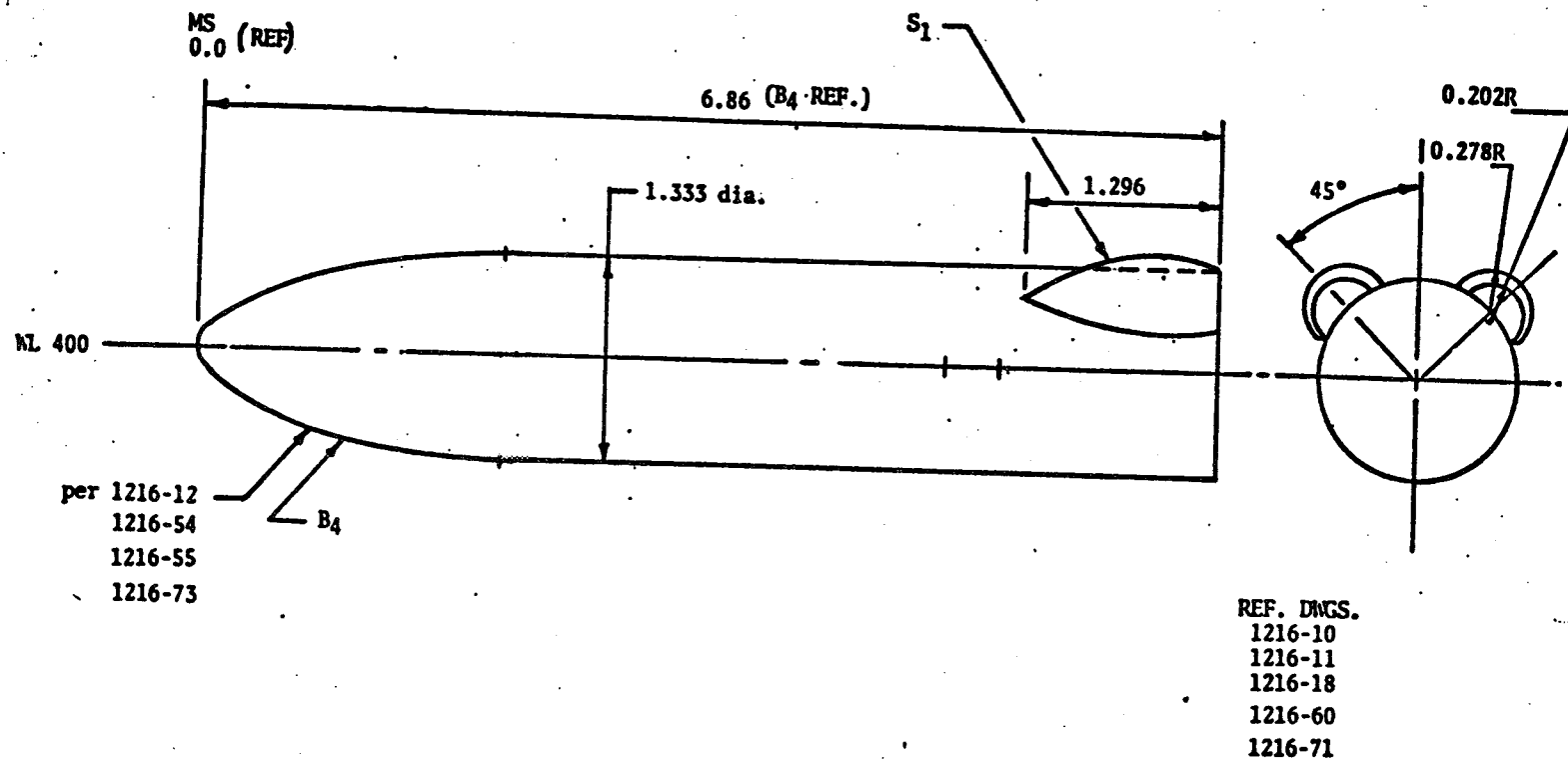


FIGURE 3. REUSABLE LOX-RP (-061) BOOSTER BODY  
0.003366 SCALE AR 12161-2 MODEL

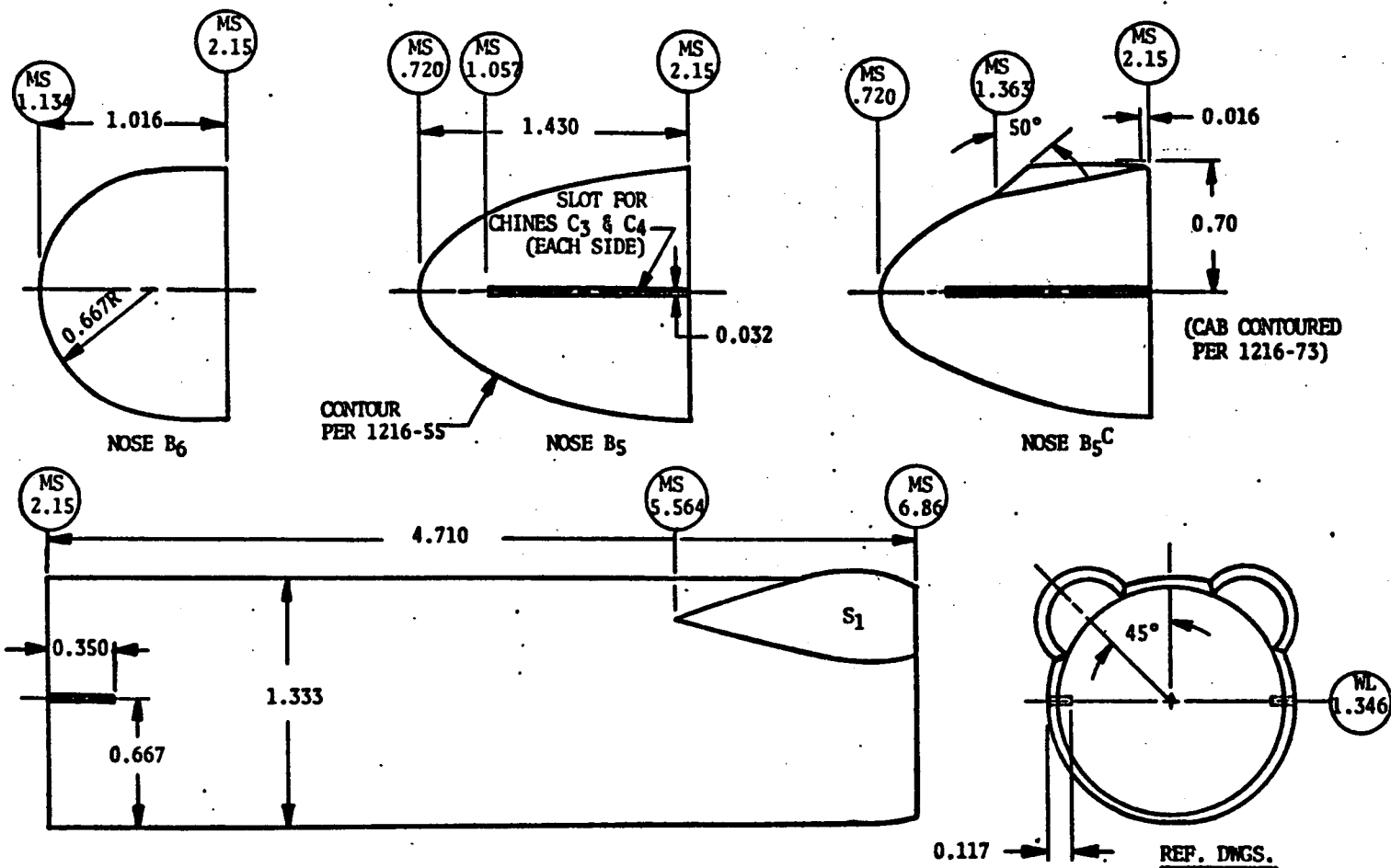


FIGURE 4. BODY B<sub>5</sub>, B<sub>6</sub> AND B<sub>5</sub><sup>C</sup>  
0.003366 SCALE AR 12161-2

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DELTA WING BOOSTER  
TBC  
DR#1209 A-1- 468

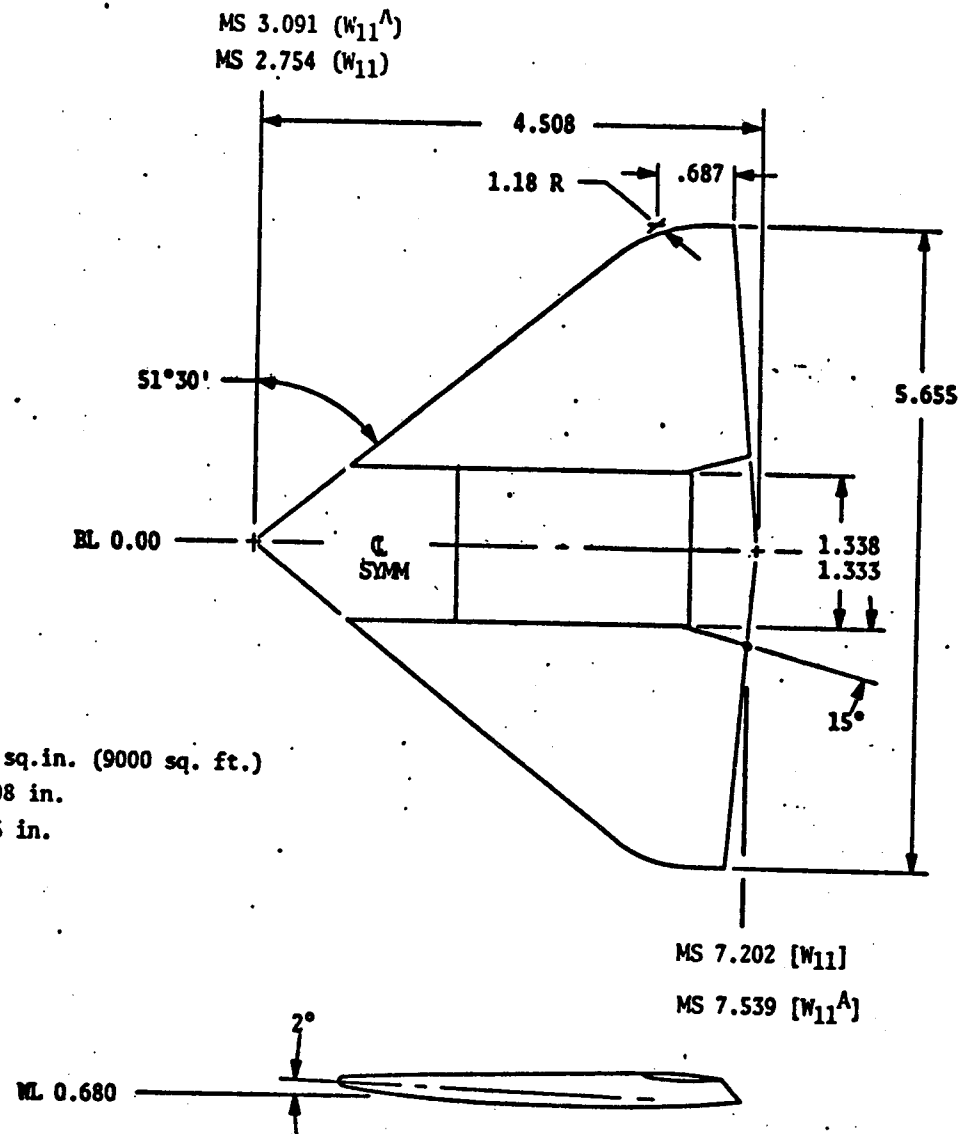
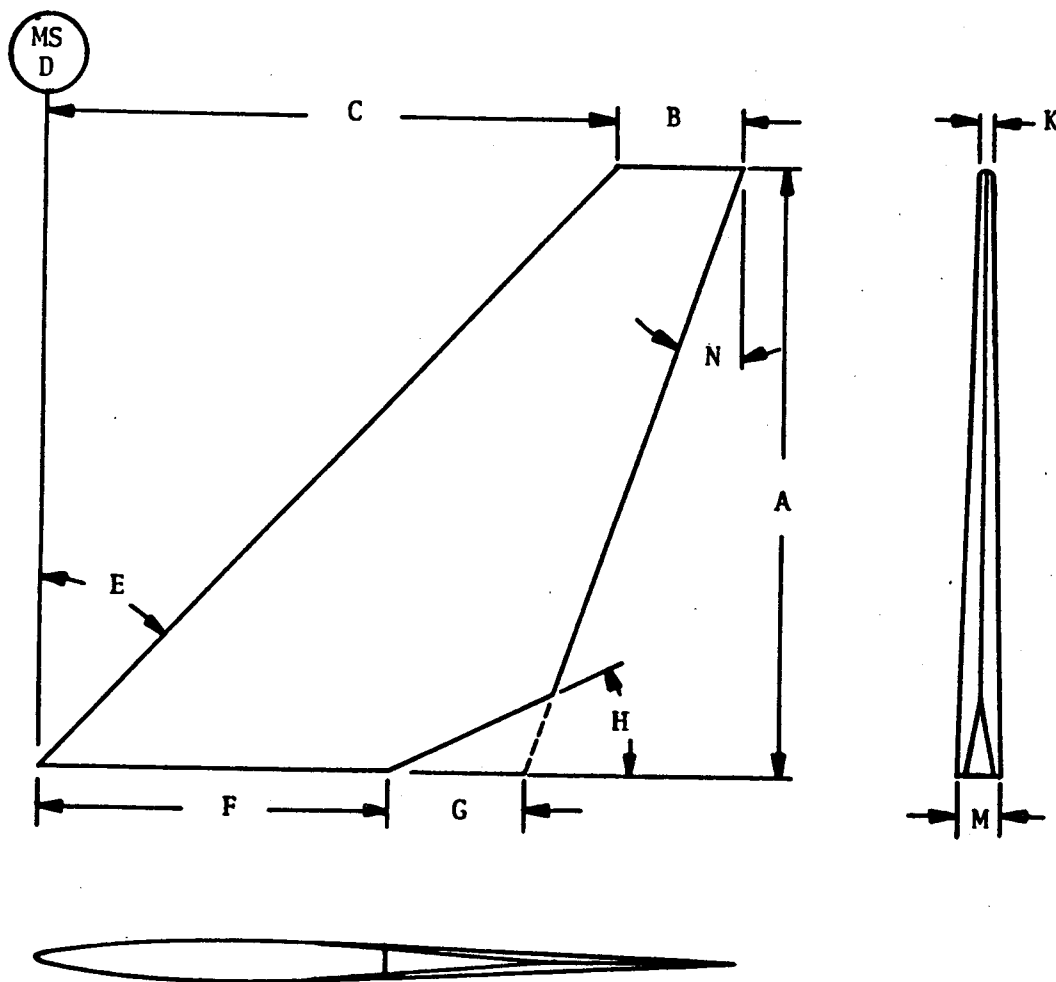


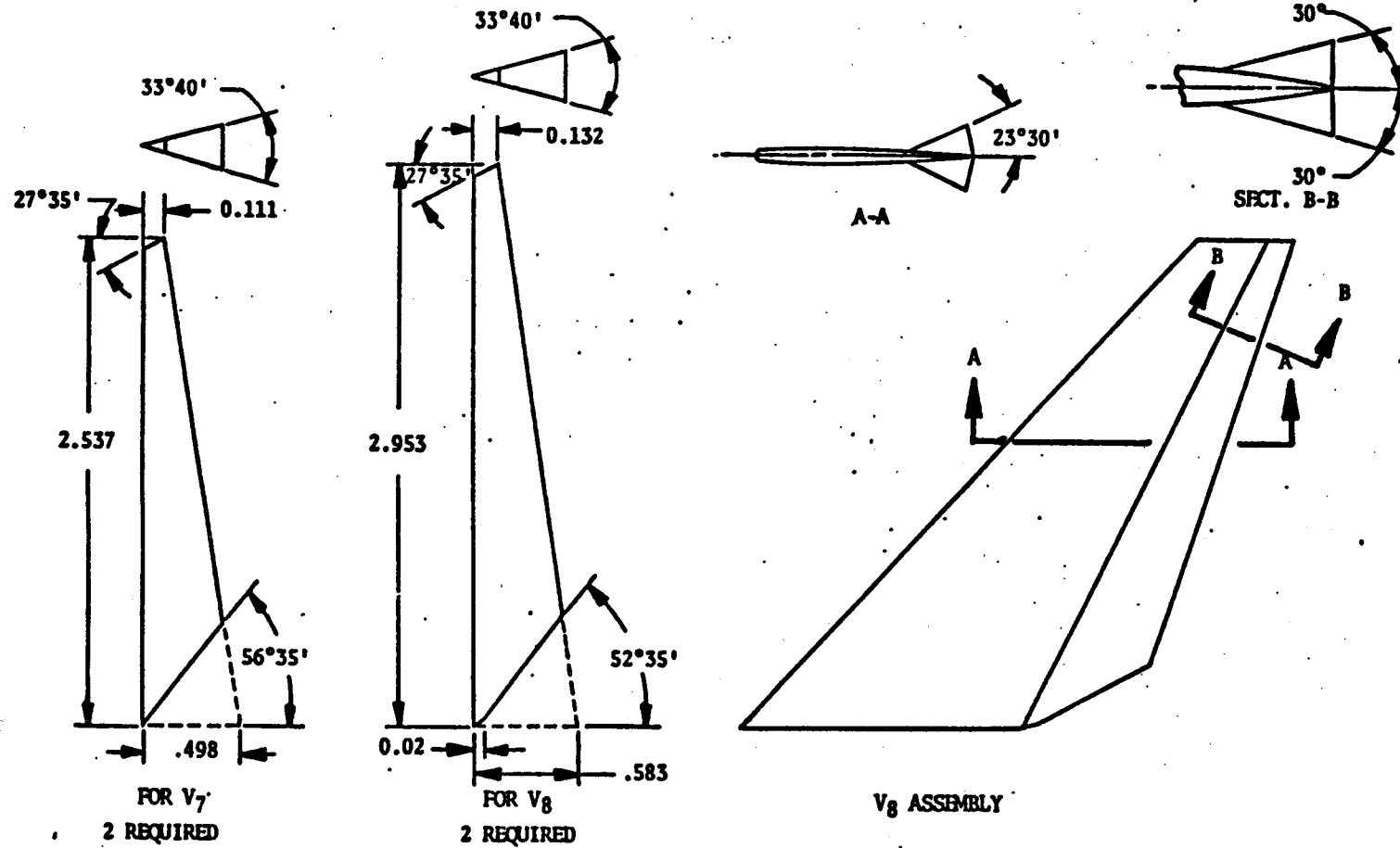
FIGURE 5. REUSABLE LOX-RP (-061) BOOSTER WING -  $W_{11}$   
0.003366 SCALE AR 12161-2 MODEL



DIMEN.	VERTICAL TAIL		
	V <sub>5</sub>	V <sub>7</sub>	V <sub>8</sub>
A	1.917"	2.212"	2.555"
B	0.854"	0.442"	0.511"
C	1.917"	2.085"	2.408"
D	5.746	5.681	5.407
E	45°	43°18'	43°18'
F	1.505"	1.179"	1.453"
G	0.20"	0.591"	0.591"
H	45°	25°	25°
K	-	0.035"	0.040"
M	0.125"	0.143"	0.165"
N	31°	18°54'	18°54'

FIGURE 6. VERTICAL TAILS V<sub>5</sub>, V<sub>7</sub> AND V<sub>8</sub>  
0.003366 SCALE AR 12161-2





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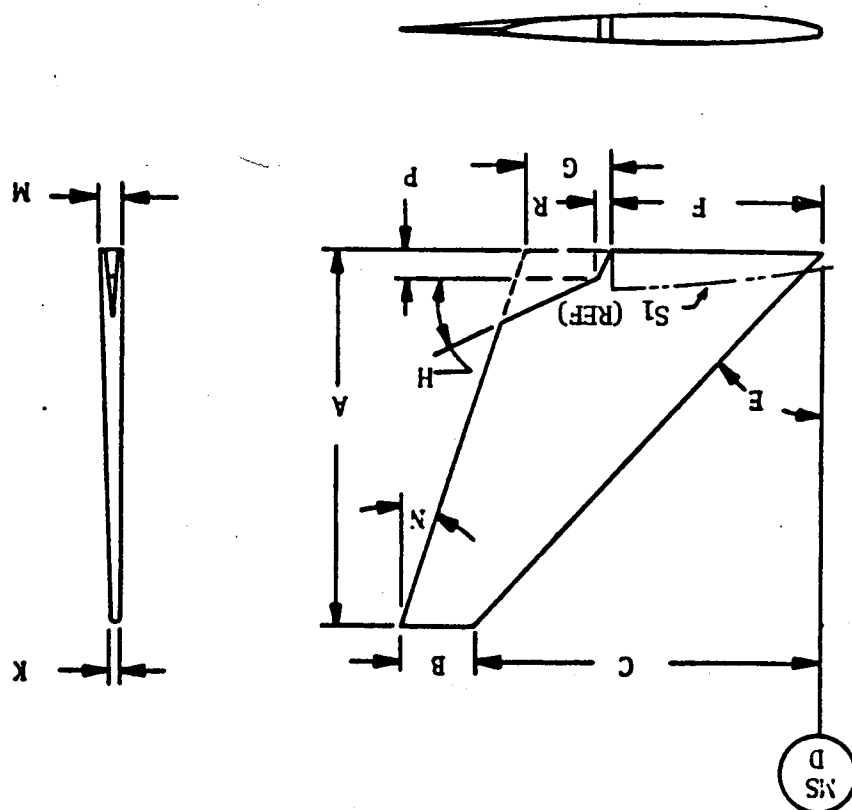
FIGURE 7. SPLIT RUDDERS - V<sub>7</sub> AND V<sub>8</sub>  
0.003366 SCALE AR 12161-2

0.003366 SCALE AR 12161-2

FIGURE 8. VERTICAL TAIL V9

\*NOTE: TWO REQUIRED TO BE  
LOCATED  $\pm 30^\circ$  OFF  
VERTICAL.

VERTICAL TAIL		DIMEN.
V9*		
A	1.564"	
B	0.313"	
C	1.474"	
D	5.969	
E	43°18'	
F	0.891"	
G	0.360"	
H	25°	
K	0.025"	
M	0.100"	
N	18°54'	
P	0.108"	
R	0.059"	



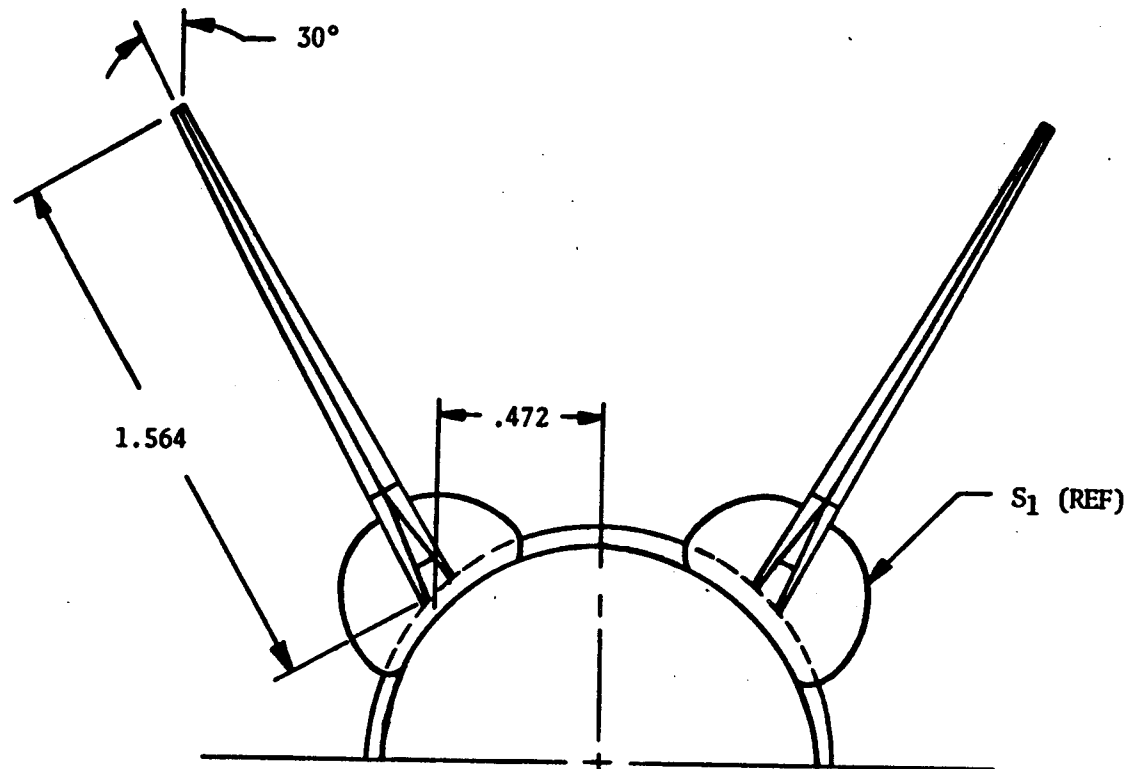


FIGURE 9. VERTICAL V<sub>9</sub> ASSEMBLY  
0.003366 SCALE AR 1216I-2

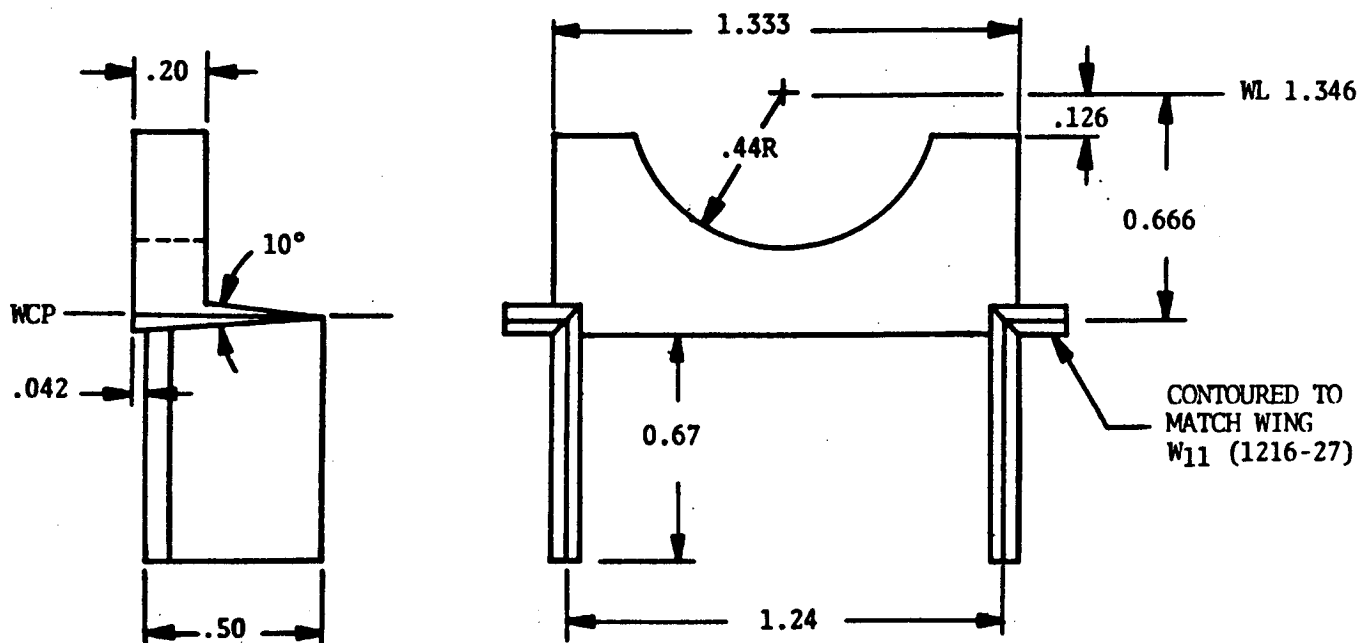
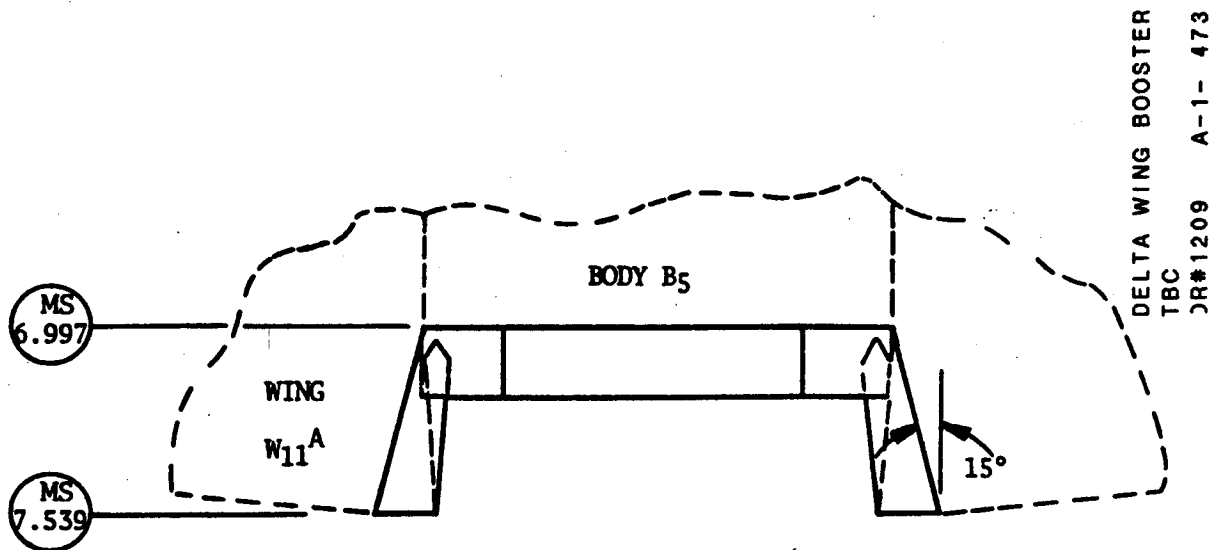
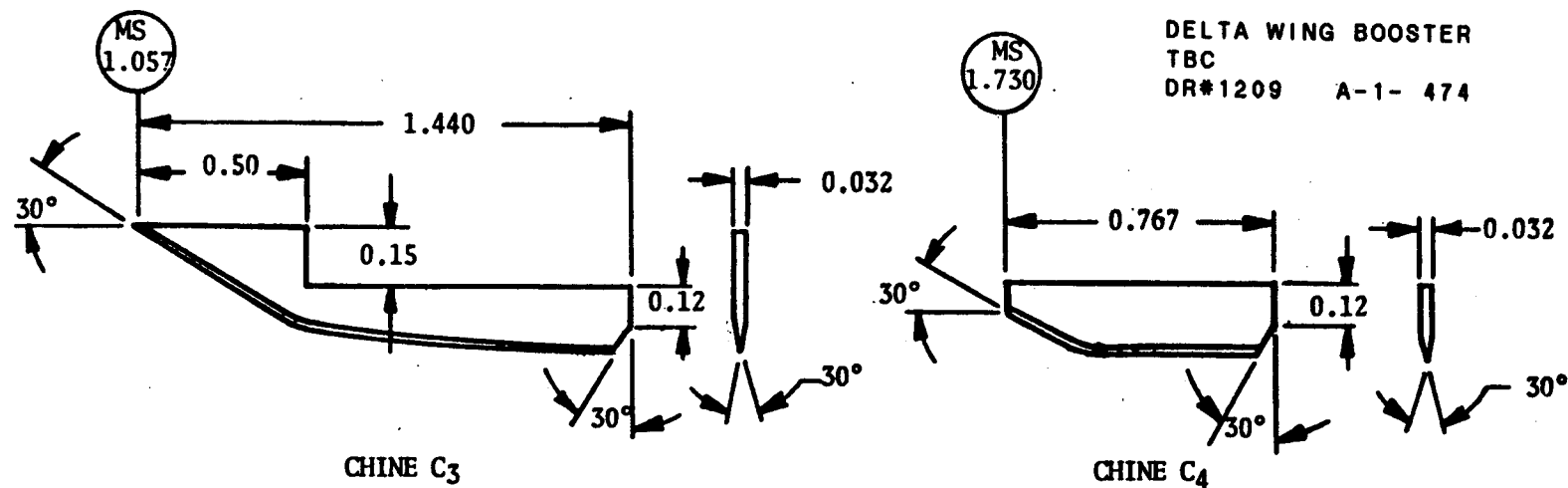


FIGURE 10. VENTRALS V<sub>10</sub>  
0.003366 SCALE AR 12161-2



REF. 1216-62 FOR LOWER CONTOURS

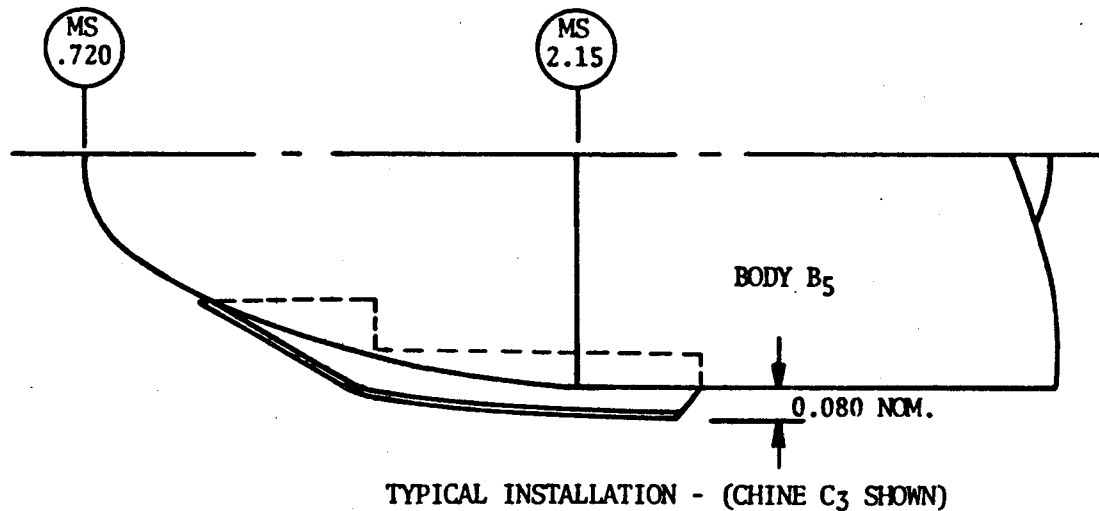


FIGURE 11. CHINES C<sub>3</sub> AND C<sub>4</sub>  
0.003366 SCALE AR 1216I-2

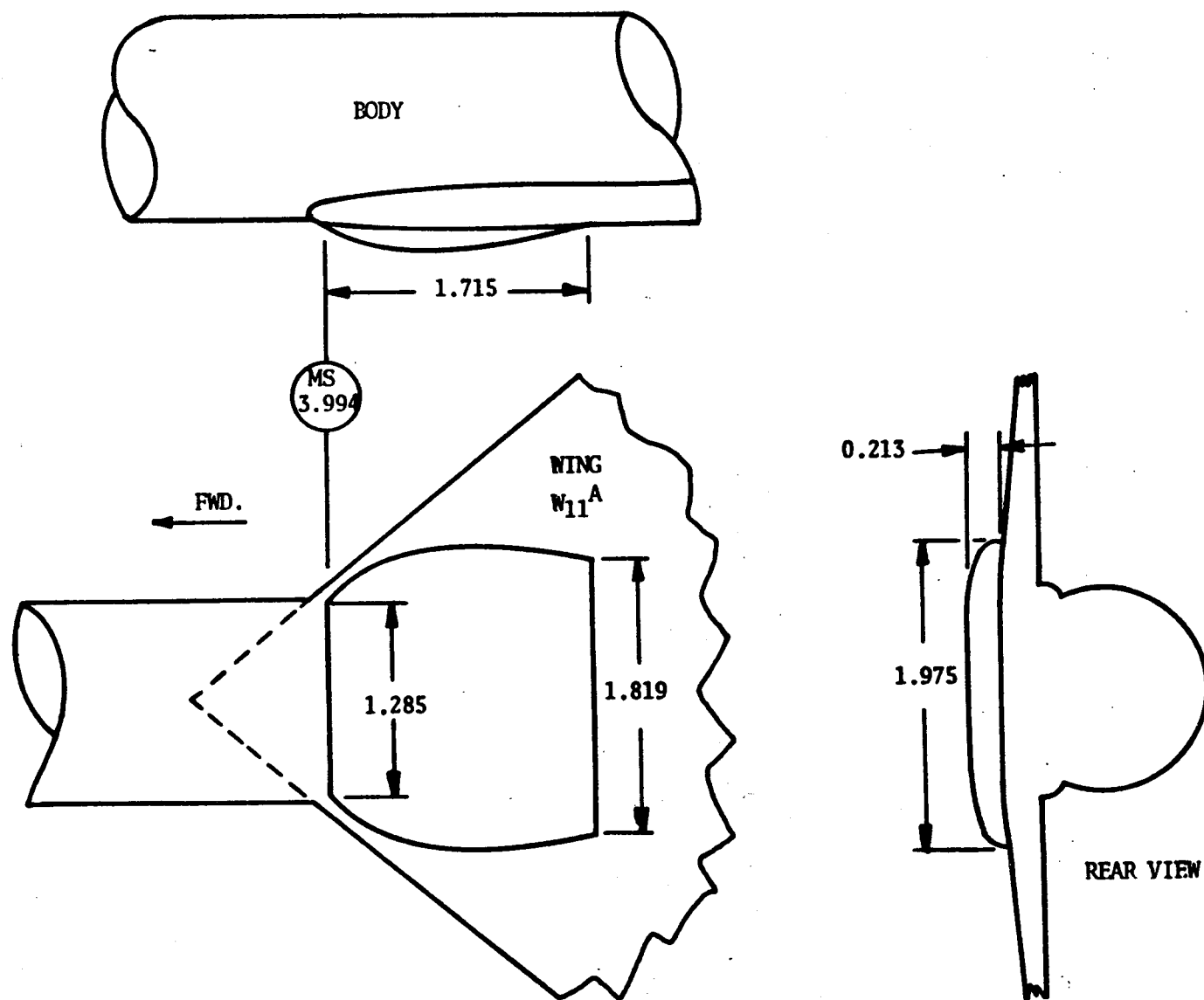


FIGURE 12. ENGINE POD E<sub>2</sub>  
0.003366 SCALE MODEL AR 12161-2

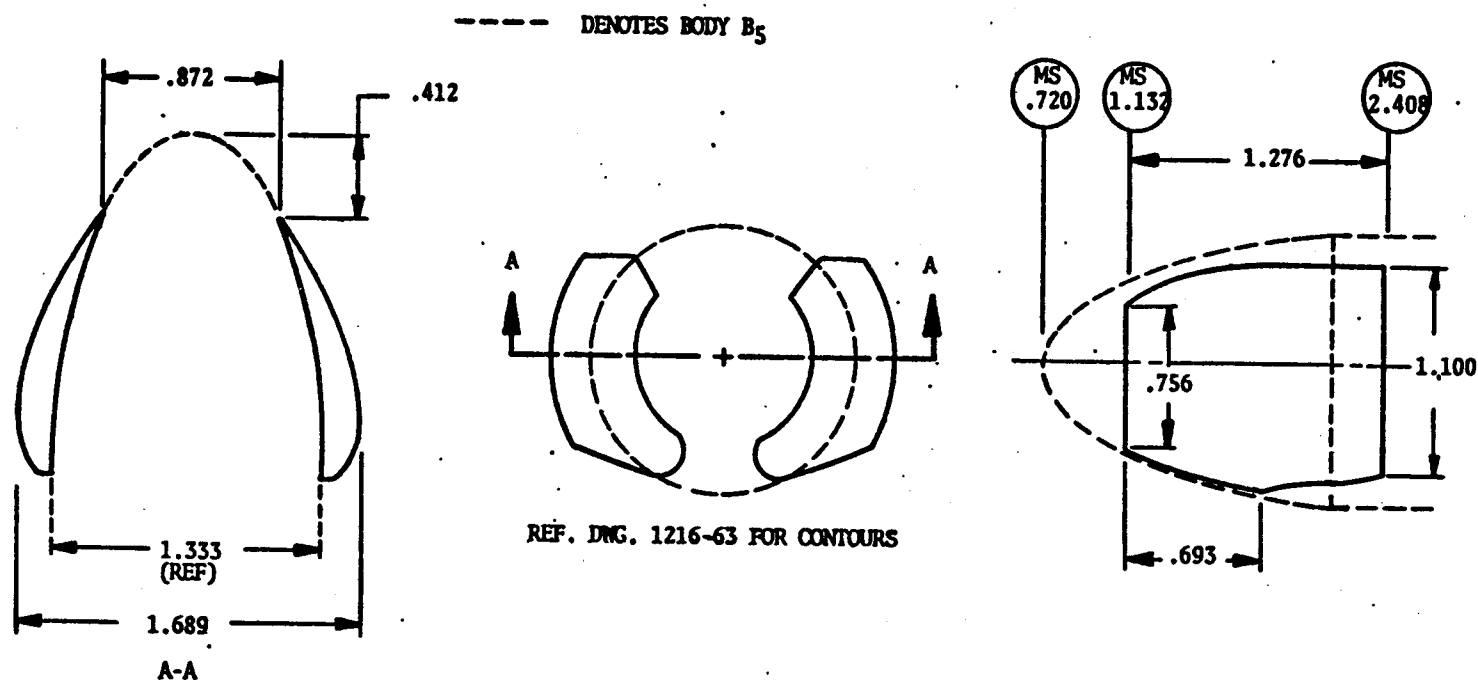
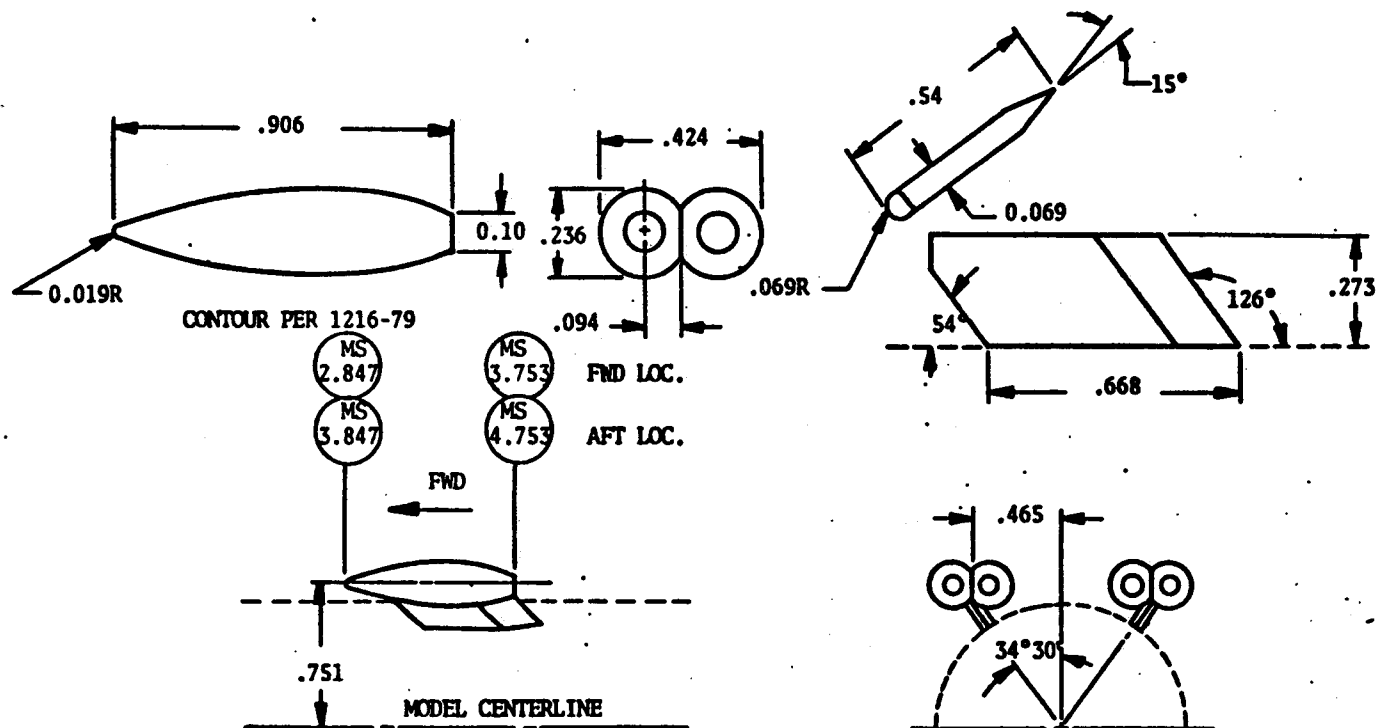


FIGURE 13. ENGINE POD E<sub>3</sub>  
0.003366 SCALE AR 12161-2



NOTE: TWO DIFFERENT  
SCALES SHOWN  
REF. DNG. 1216-79

FIGURE 14. ENGINE PODS E4  
0.003366 SCALE AR 1216I-2



DELTA WING BOOSTER  
TBC  
DR#1209 A-1- 478

USE GRIT #180

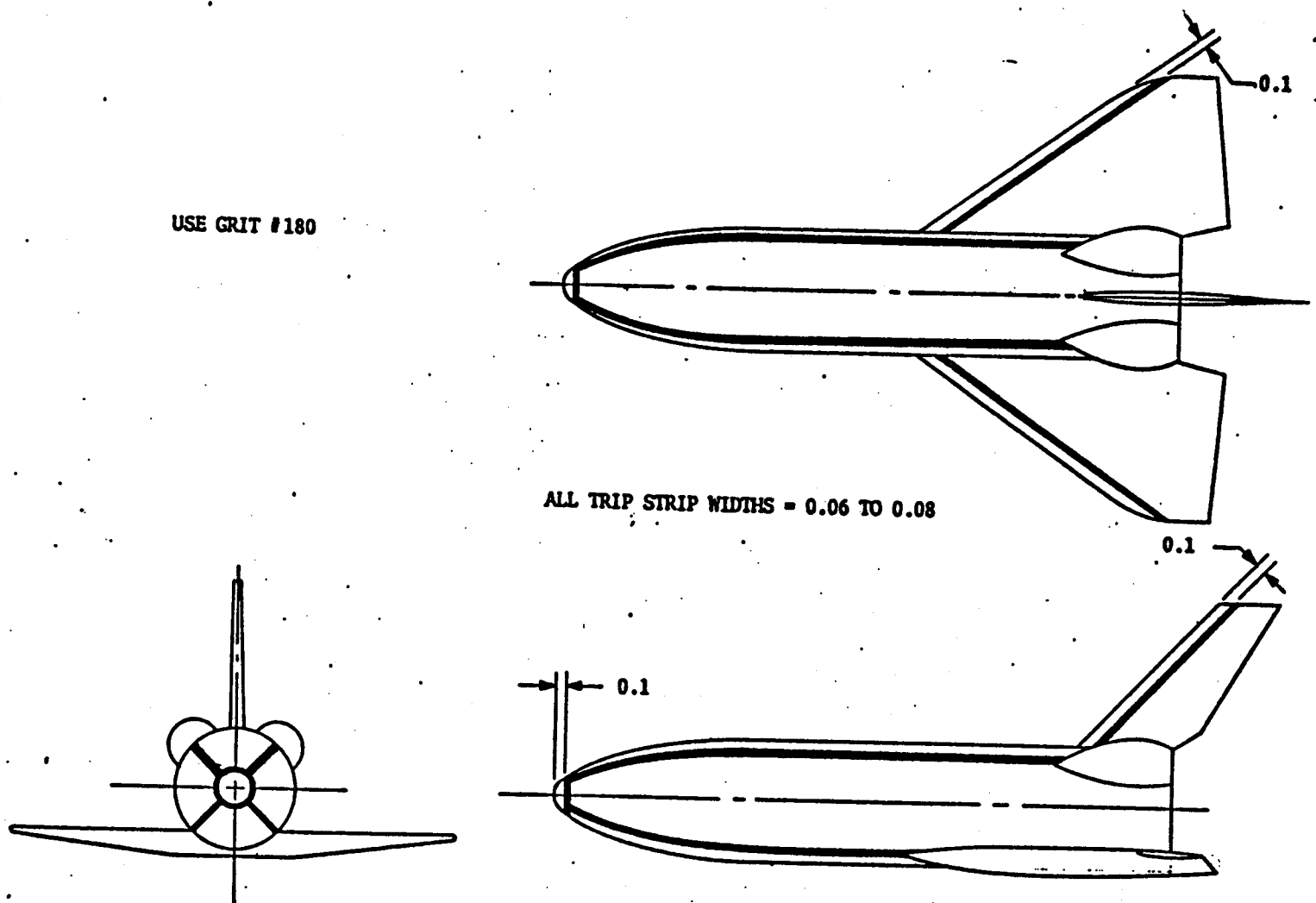


FIGURE 15. TRIP STRIP CHART  
AR1216I-2 MODEL

TABLE 1. TEST LaRC 6398 DATA SET/RUN NUMBER  
COLLATION SUMMARY

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)															
		$\alpha$	$\beta$	$\delta_{ER}$					6.0															
R02011	B <sub>1</sub>	A	-4	-				1	22															
012	B <sub>1</sub>	B	5.6	-				1	23															
021	B <sub>1</sub> W <sub>1</sub>	A	-4	0				1	7															
031		A	-4	-20				1	8															
032		B	5.6	-20				1	11															
041		A	-4	-50				1	13															
051	B <sub>1</sub> W <sub>1</sub> E <sub>1</sub>	A	-4	0				1	17															
061		A	-4	-20				1	15															
062		B	5.6	-20				1	16															
071		A	-4	-50				1	14															
081	B <sub>1</sub> W <sub>1</sub> E <sub>2</sub>	A	-4	0				1	18															
091		A	-4	-20				1	19															
092		B	5.6	-20				1	20															
101		A	-4	-50				1	26															
111	B <sub>2</sub>	A	-4	-				1	27															
112	B <sub>2</sub>	B	5.6	-				1	28															
121	B <sub>2</sub> W <sub>1</sub>	A	-4	-20				1	24															
122	B <sub>2</sub> W <sub>1</sub>	B	5.6	-20				1	25															

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
CN CA CLM CBL CYN CY CL CD L/D CAB

COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

$\alpha A$ : 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80  
 $\alpha B$ : 30, 40, 50, 60, 70, 80

IDPVAR(1) IDPVAR(2) NDV

NASA-MSFC-MAF

DELTA WING BOOSTER  
TBC  
DR#1220 A-1- 480

AX-1229I-1  
BODIES

MS  
5.027

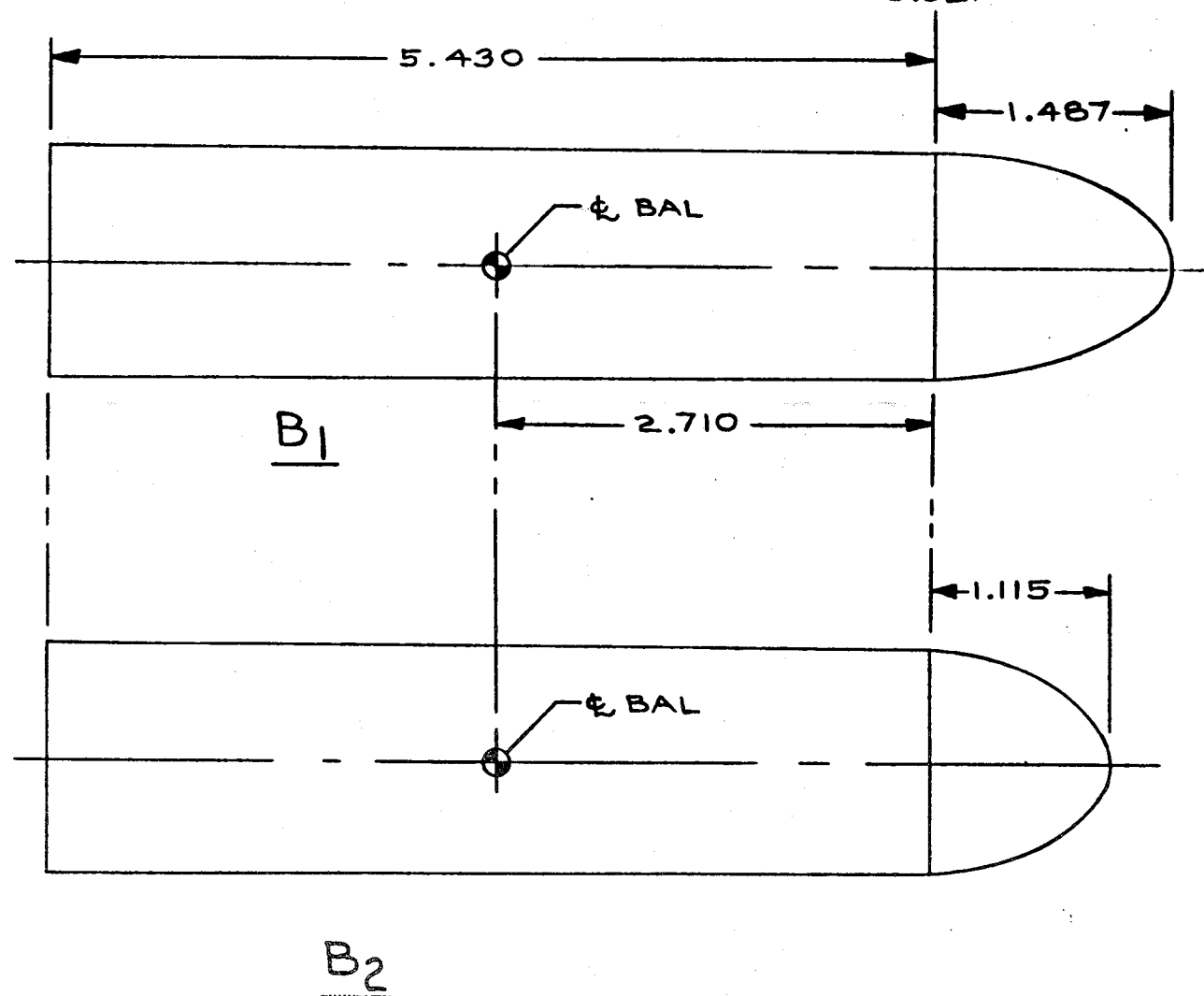


FIGURE B. AX-1229I-1 BODIES B<sub>1</sub> and B<sub>2</sub>

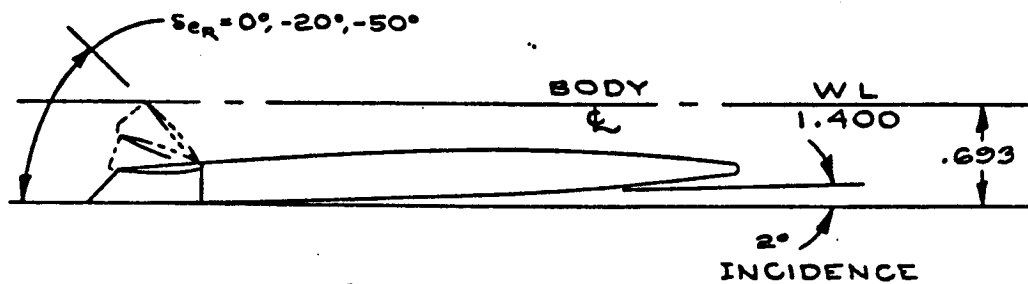
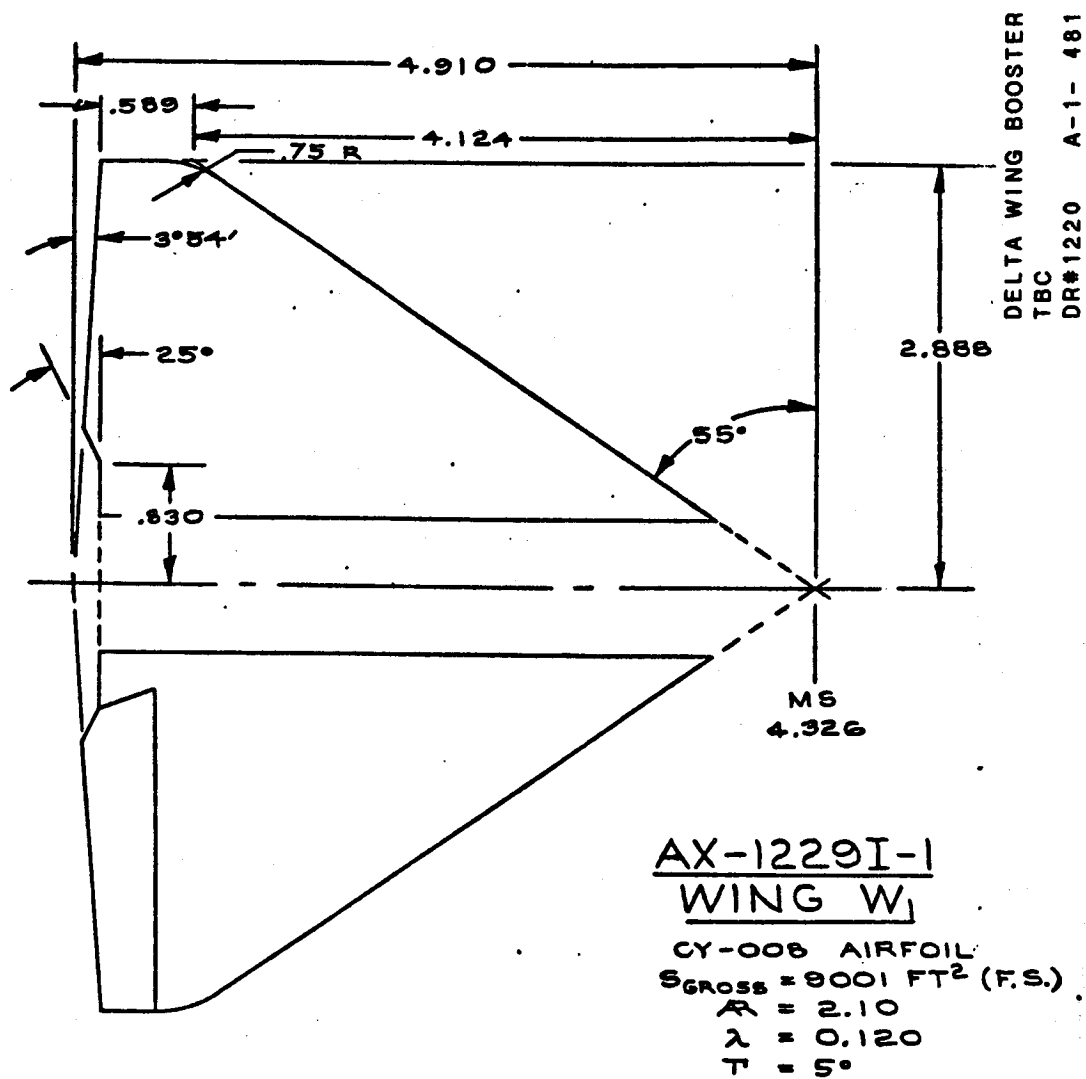


FIGURE C. AX-1229I-1 WING W<sub>1</sub>

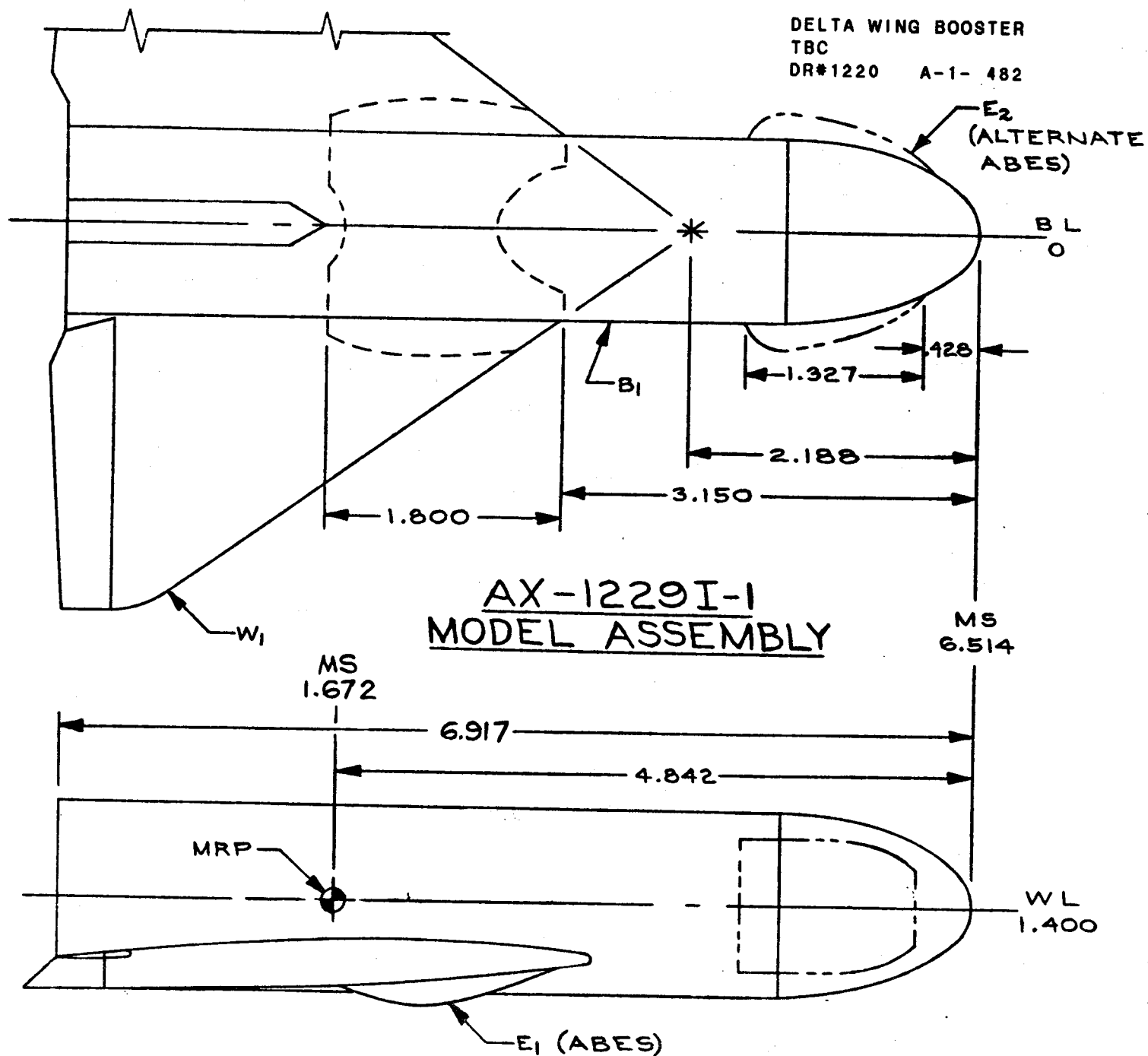


FIGURE D. AX-1229I-1 MODEL ASSEMBLY

# TEST HSWT 291-0 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS											
		$\alpha$	$\beta$	$\delta_e$	$\delta_a$	$\delta_{e_w}$	$\delta_z$		0.9	1.1	1.3	1.6	2.0	3.0	4.4	4.6				
RC 6010	BIW371-55	A	0	0	0	0	0	5	55	56	54	29			30					
RC 6020		B	0	0				1							36					
RC 6030		A	-5	0				1				28								
RC 6040		A	0	+20				3	80	57					31					
RC 6050		B	0	+20				1							37					
RC 6060		A	0	-20				1							32					
RC 6070		A	0	-40				3	81	58					33					
RC 6080		B	0	-40				1							35					
RC 6090		A	0	-25	+15			2	82						39					
RC 6100	BIT1-55	A	0	0	0	0	0	3	68	67					52					
RC 6110	BIW3	A	0					3	69	70					50					17
RC 6120	BI	A	0					3	65	66					51					
RC 6130	BIWIT1-55	A	0	0	0	0	0	4				2	8	4		22				
RC 6140		B	0					5				10	9	19	18	13				
RC 6150		B	-5					2				17			16					
RC 6160		A	-5					1				27								
RC 6170		A	0	+20				1							19					
RC 6180		A	0	-20				1							20					
RC 6190		A	0	-40				1							21					
RC 6200		B	0	-40				1							15					

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CLM	EN	CR	EY	KBL	CYN								6

COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

$\alpha A = -1$  TO  $30$   
 $\alpha B = 28$  TO  $62$

STRAIGHT WING BOOSTER  
GD/C  
DR#1025 A-1- 483

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STRAIGHT WING BOOSTER  
GD/C  
DR#1025 A-1- 484

TEST HSWT 291-0 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCH.D.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS									
		A	B	$\delta e$	$\delta a$	$\delta w$	$\delta s$		0.9	1.1	1.3	1.6	2.0	3.0	4.4	4.6		
RC6210	B1W1T1-55	A	0	-25	+15	0	0	2				24			23			
RC6220	↓	A	0	-20	0	0	+20	2				25	26					
RC6230	B5W3T1-55	A	0	0	0	0	0	2	28	77								
RC6240	↓	A	0	+20	0	0	0	1		79								
RC6250	B1W3T1-90V1	A	0	0	0	0	0	4	60	59		86			48			
RC6260	↓	B	0	↓	↓	↓	↓	1							38			
RC6270	↓	A	0	-40	↓	↓	↓	3	61	62					49			
RC6280	B1T1-90V1	A	0	0	0	0	0	3	64	63					47			
RC6290	↓	B	0	0	0	0	0	1							39			
RC6300	B7W5V1E7	A	0	0	0	0	0	2		75					43			
RC6310	B7W5V1	A	0	0	0	0	0	3	73	74					42			81
RC6320	↓	↓	↓	↓	↓	+5	↓	1							53			
RC6330	↓	↓	↓	↓	↓	-40	↓	2		76					45			
RC6340	B7V1	A	0	0	0	0	0	3	72	71					46			
RC6350	BBW5V1	A	0	0	0	0	0	1							41			
RC6360	↓	B	0	0	0	0	0	1							40			

1 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71 75 79

CLM CN CA CY CBL CYN

COEFFICIENTS:

" or B

SCHEDULES

$\alpha A = -1$  TO 30

$\alpha B = 28$  TO 62

DPVAR(1) DPVAR(2) RDV

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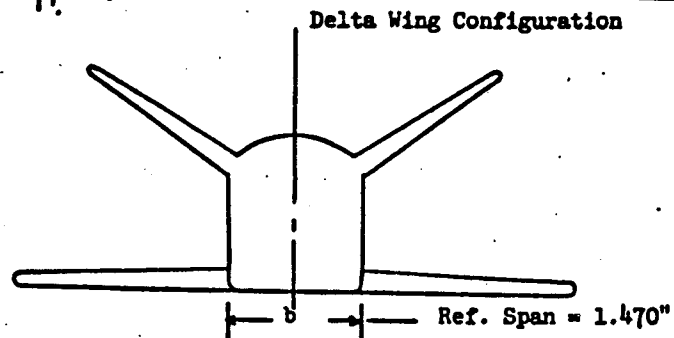
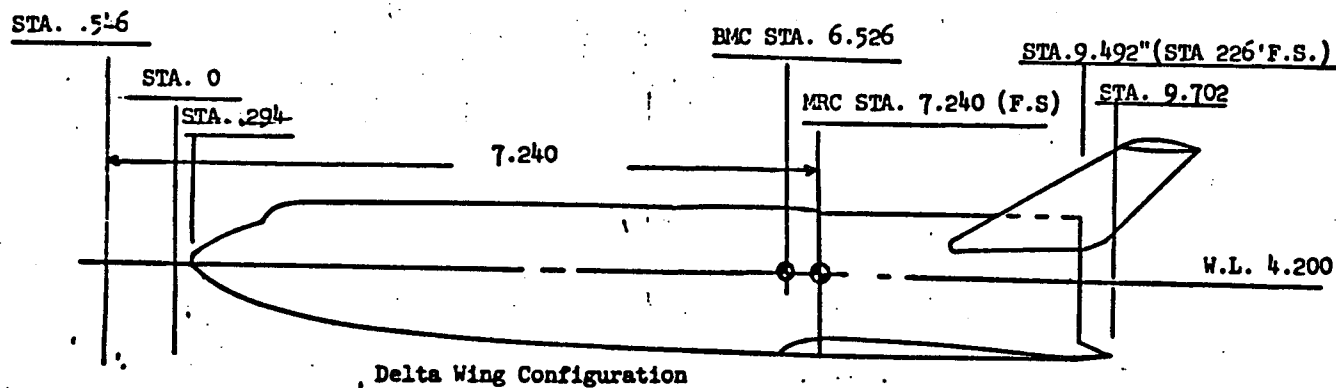
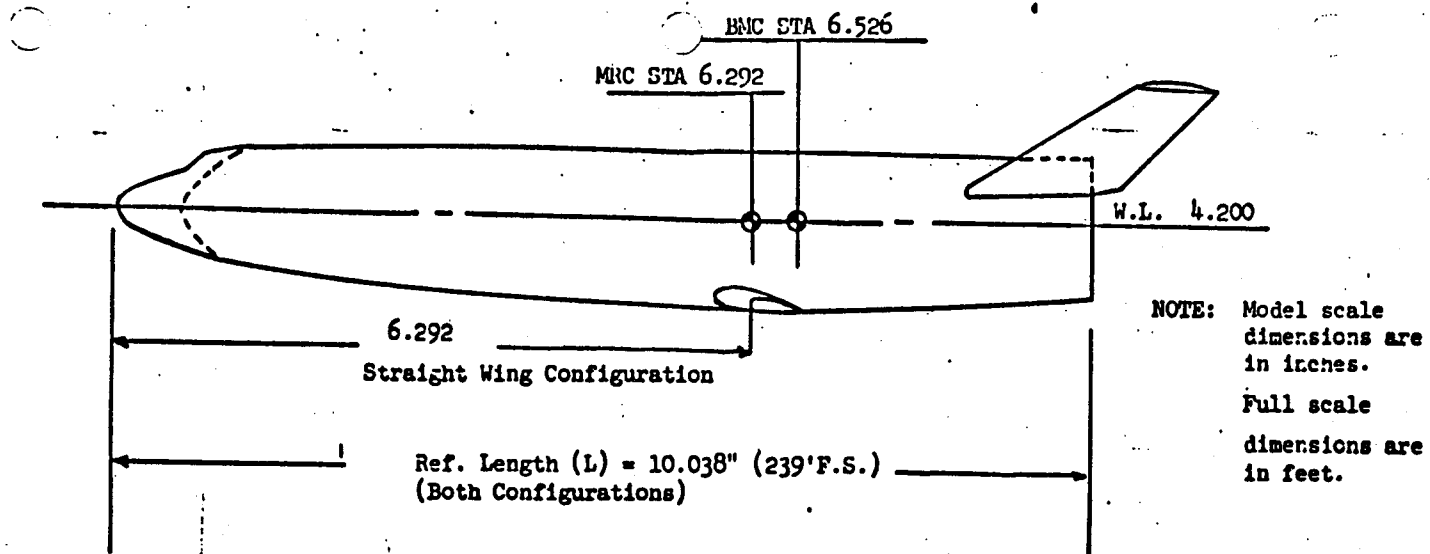


Figure 2  
Moment Transfer Diagram and Reference  
Lengths.

STRAIGHT WING BOOSTER  
GD/C  
DR#1025 A-1- 485



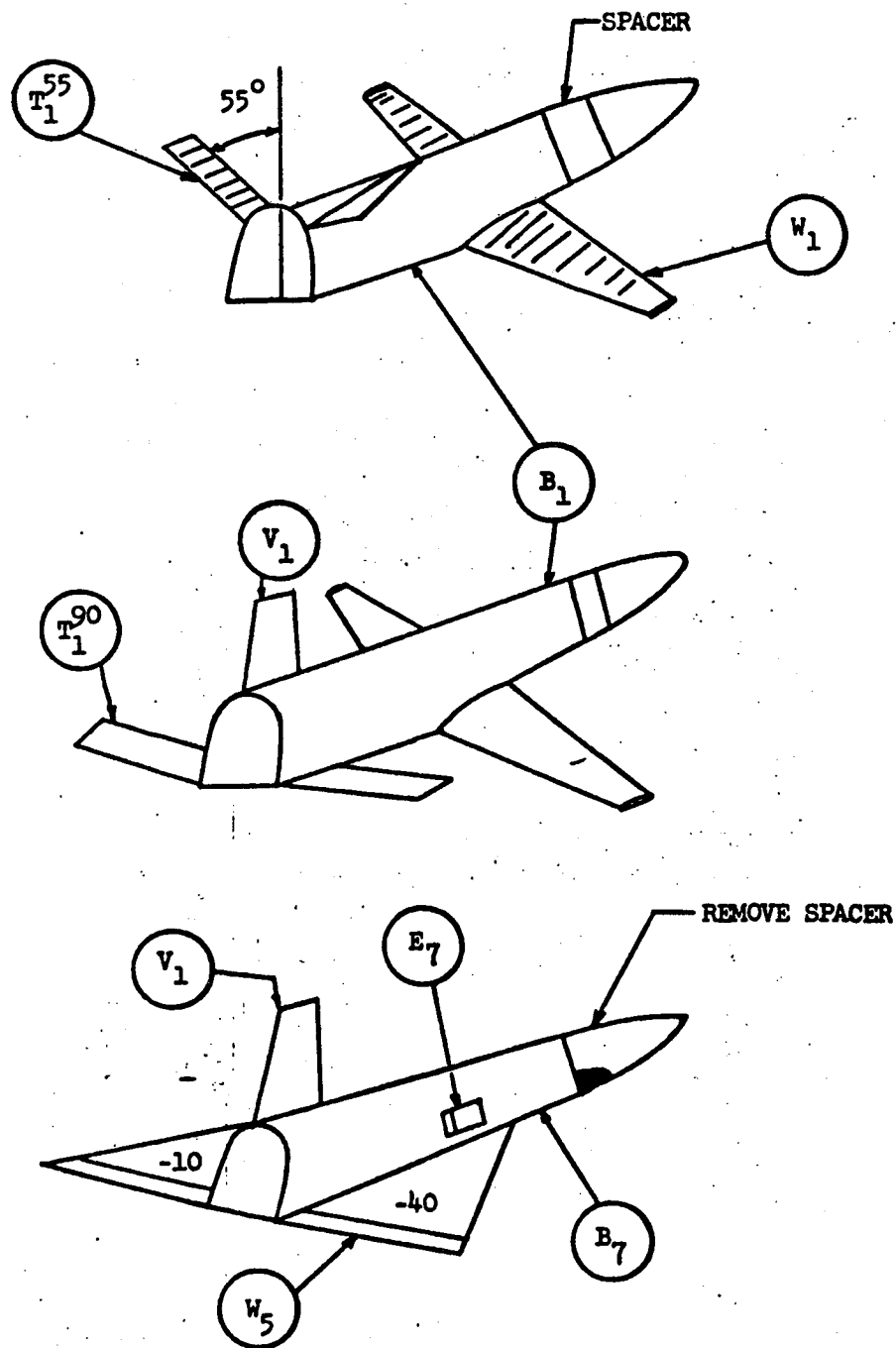


Figure 6 Isometric Views of Complete Configurations Tested.

α or β RANGE  
CONFIGURATION

TEST, LRC-LTPT-55 DATA SET - ORGANIZATION - SHEET

EXCITATOR OR LUPPER PORTION

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	REYNOLDS NUMBER $10^6$ PER FOOT							
		α	β	INL	INR	Sc	SL		2.5	4.0	6.0	8.0	10.0	12.0	14.0	
RLAADA	B18WBV6H8E29-B <sub>c</sub>	A	0	0	0	0	0	7	1	2	3	4	5	6	8	
C				10	10			1					11			
D				-10	-10								13			
E				-20	-20								15			
I				10	-10								17			
K				0	0	0	-10						19			
R				0	0	10	0	2				22	20			
L				"	"	-20	"	1				24				
RLAFAA	B <sub>c</sub> F <sub>2</sub> <sup>20</sup>			0	0	0	0					26				
EN	"			-10	-10	-10						27				
FN	B <sub>c</sub> F <sub>2</sub> <sup>40</sup>			-10	-10	-10						28				
FD				-10	-10	0						29				
FA				0	0	0						30				
GA	B <sub>c</sub> S <sub>2</sub> <sup>60</sup>											31				
JA	B <sub>18</sub> W <sub>2</sub> V <sub>6</sub> H <sub>8</sub>											32				
CA	B <sub>18</sub> W <sub>2</sub> H <sub>8</sub> E <sub>29</sub>											33				
BO	B <sub>18</sub> W <sub>2</sub> E <sub>29</sub>			-	-	-	-					34				
KA	B <sub>18</sub> H <sub>8</sub>			0	0	0	-					35				
AO	B <sub>18</sub>			-	-	-	-					36				

(α) A - 4° to 20° with 0° KNOCKLE, β = 0 | D SAME EXCEPT AS A, β = 5° to 0°

B	20° to 44°			E	
C	44° to 68°			F	

α or β  
SCHEDULES

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STRAIGHT WING BOOSTER  
GD/C  
DR#1100 A-1-488

TEST LR047P7-55 DATA SET - ORIENTATION - SHEET

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DATA SET IDENTIFIER	CONFIGURATION	SCHD.				CONTROL DEFLECTION				NO. OF RUNS	REYNOLDS NUMBER 10 <sup>6</sup>									
		A	B	C	D	1H	2H	3H	4H		25	40	60	80	100	120	140			
RLD40	Bir	A	D	-	-	-	-	-	-	1	37									
KA	BirHr			0	0	0	-	-	-	1	38									
BO	BirHrE29			-	-	-	-	-	-	1	39									
CA	BirHrHrE29			0	0	0	-	-	-	1	40									
JA	BirHrHrHr			1	1	1	1	1	1	1	41									
DA	BirHrHrHrE29			1	1	1	1	1	1	7	42	43	44	45	46	47	48			

of 8  
SCHEDULES

نی

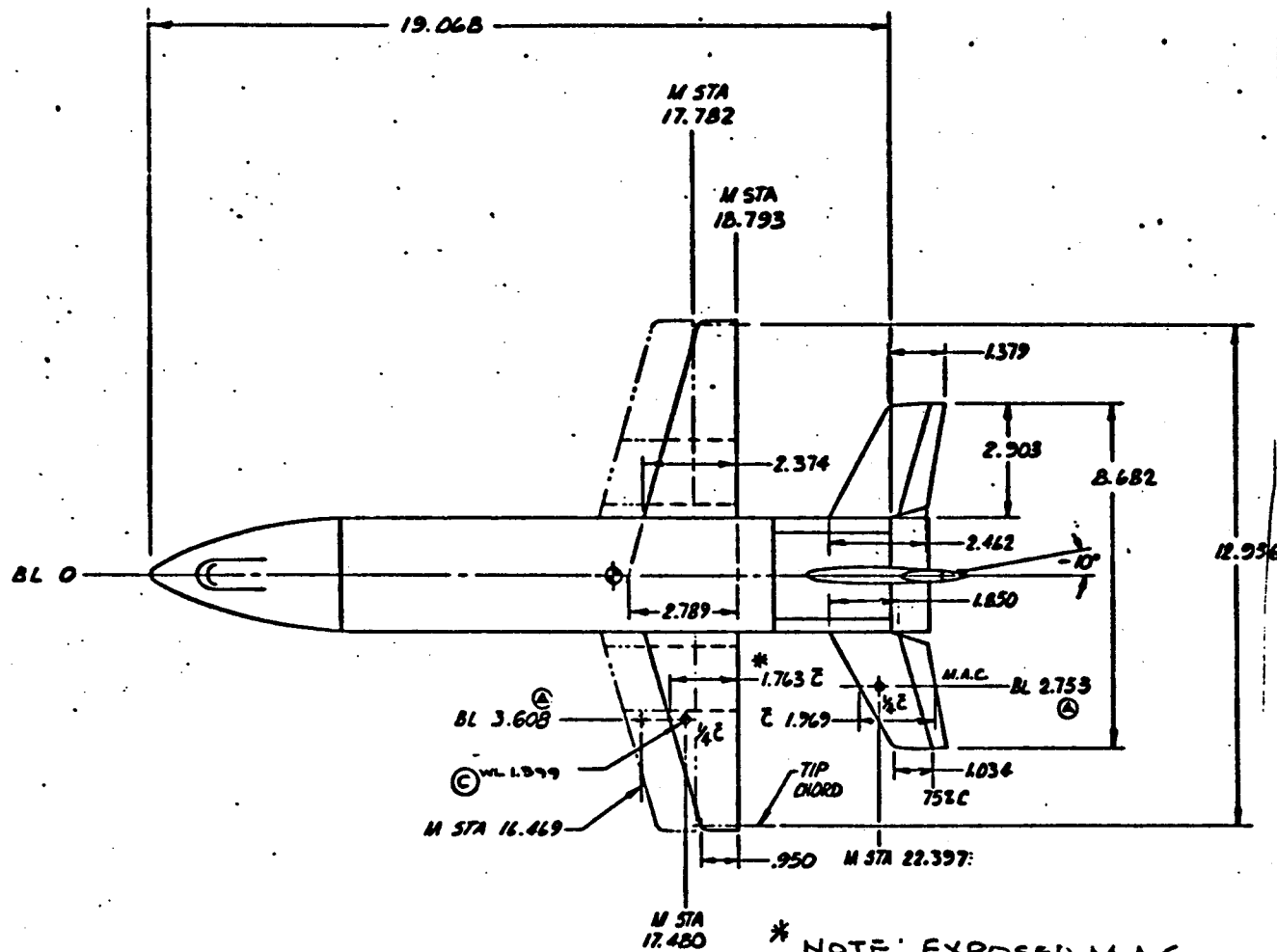
$\alpha$  in reverse order

8 OF 8  
SCHEDULES

STRAIGHT WING BOOSTER  
GD/C  
DR#1100 A-1- 489

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STRAIGHT WING BOOSTER  
GD/C  
DR#1100 A-1- 490



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Figure 5. The 0.0076 Scale B-8H-1  
Booster Model, Top view.

\* NOTE: EXPOSED M.A.C.  
THEO M.A.C. = 2.016 INCHES

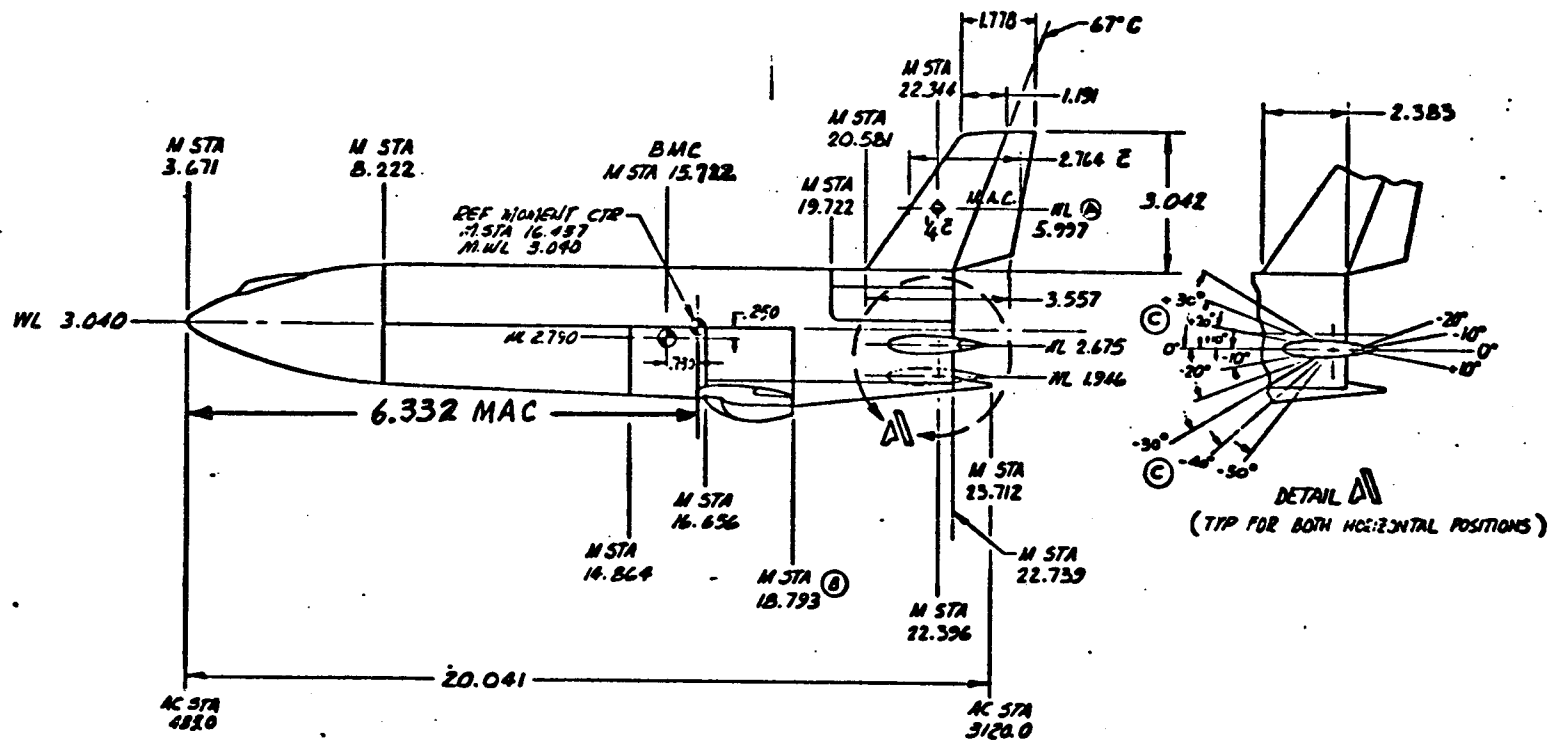


Figure 6. The 0.0076 B-8H-1 Booster Model, Sideview.

STRAIGHT WING BOOSTER  
GD/C  
DR#1100 A-1- 491

STRAIGHT WING BOOSTER  
GD/C  
DR#1100 A-1- 492

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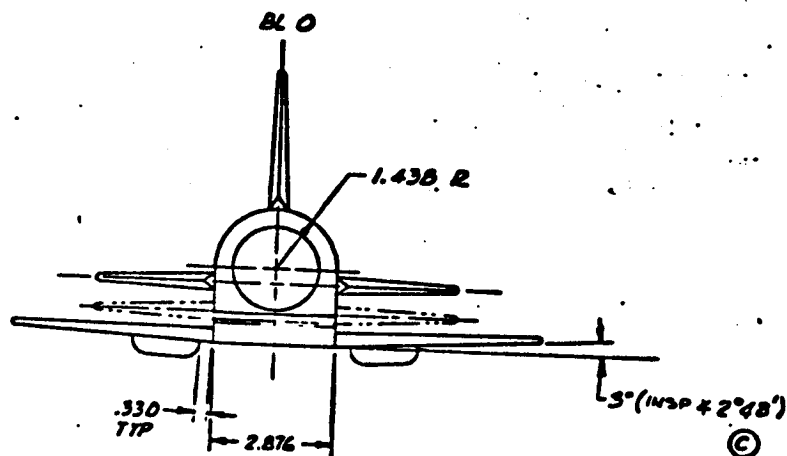
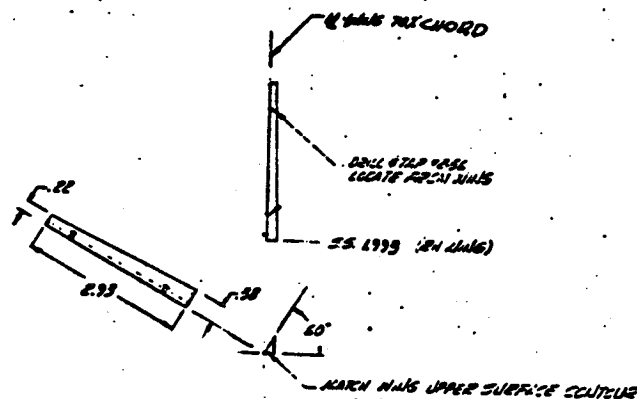
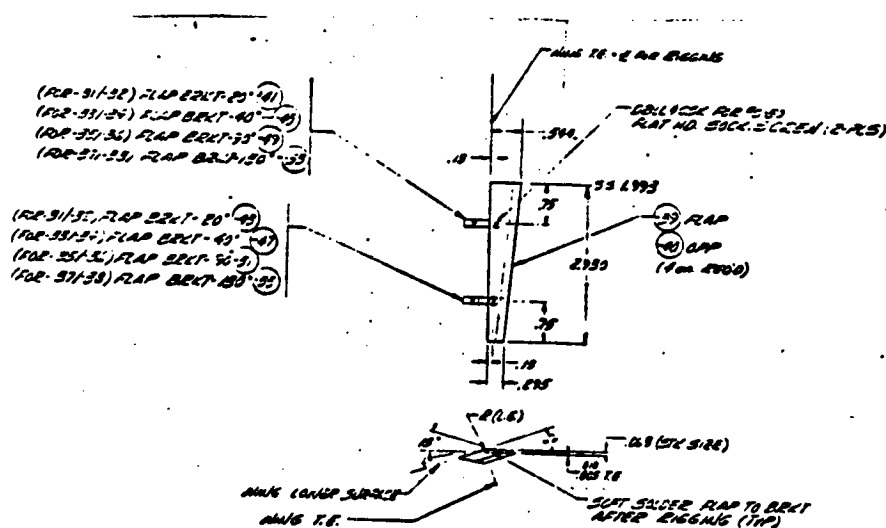


Figure 7. The 0.0076 Scale B-8H-1 Booster Model, Front View.



① DETAIL - 57 SPOILER-60° (RH WING) (12800)  
SCALE-1/1, 4.472 17-4PA 5/2, N.T.-N500



② DETAIL - 31/32 AND FLAP ASSY-20°  
-33/-34 CAP -40°  
-35/-36 CAP -90°  
DETAIL - 37/38 CAP FLAP ASSY-130°  
SCALE-1/1, (10A 2820), NATL-4120 CH13, N.T.-ALUMINUM

Figure 8. Flap and Spoiler for the 0.0076 Scale B-8H-1 Booster Model.



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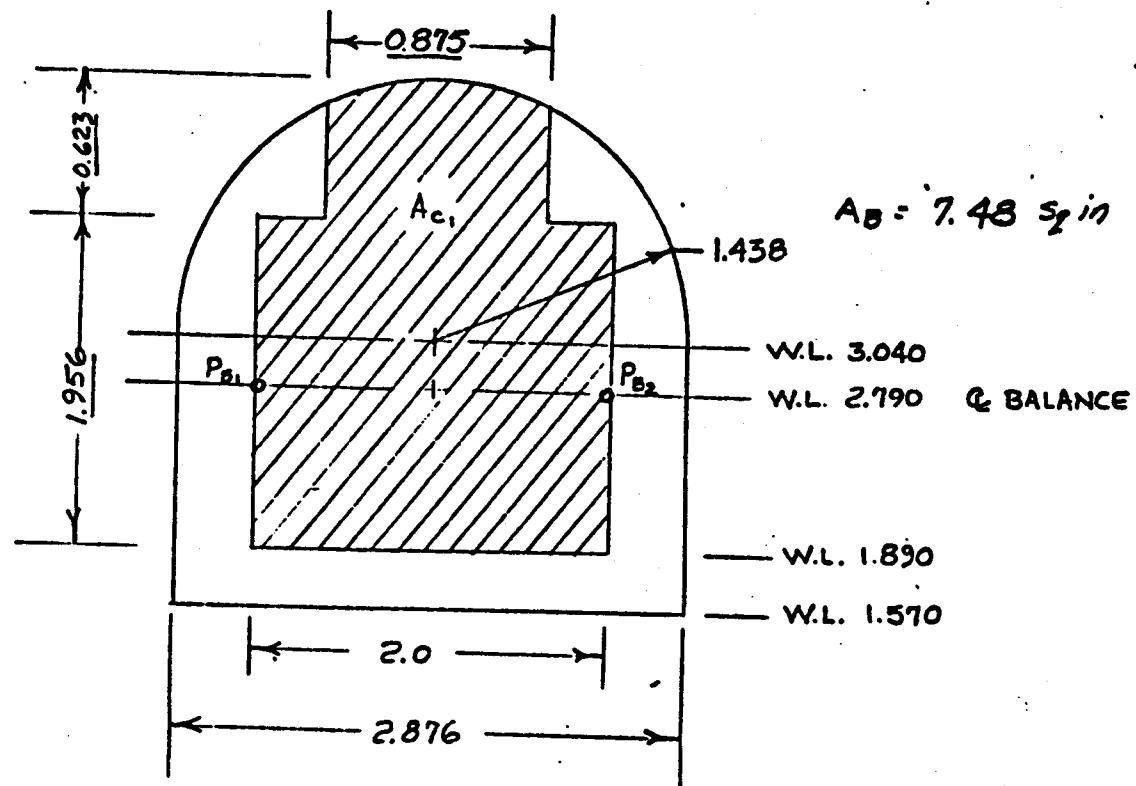


Figure 9. Base Pressure Tap Locations

TEST MSC 5 XXIV DATA SET COLLATION SHEET

Force Test MSC Booster 251

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCD.	CONTROL DEFLECTION	NO. of RUNS	TAIL IDENTIFICATION NUMBERS (IT)
RG4001	B82 W81 V81 H81	A	0.70	0	20
RG4002	B82 Y81 H81			21	23
RG4003	B82 H81			32	31
RG4004	B82 W81 V81 H81			33	34
RG4005	B82 W81 V81 H81	A	0.67	0	59
RG4006	B82	B	0.67	0	44
RG4007	B82 V81	A	0	11	25
RG4008	B82 W81 V83	A	0.67	104	15
RG4011	B82 W81 V84	A	0.67	107	109
RG4012	B82 W81 V83	B	0.67	105	106
RG4013	B82 W81 V84	B	0.67	106	107
RG4007	B82 H81	A	0	14	43
RG4009	B82 W81 V81 H81	A	0.67	0	43

COEFFICIENTS:	SCHEMULES	or B
A	-10 -20	
B	-10 -10	
IDPVAR(1)	IDPVAR(2)	IDV

STRAIGHT WING BOOSTER  
MSC  
DR#1033 A-1-495

TEST MSC S-XXIV DATA SET COLLATION SHEET  
Force Test MSC Booster 251

STRAIGHT WING BOOSTER  
MSC  
DR#1033 A-1- 496

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	WING LOCATION MACH NUMBERS $\bar{c}_{N/4}$ (CBRW)									
		A	B	Se	$\bar{c}_{N/4}$	$\bar{c}_T$			.64	.67	.70							
RG4014	BB2 WB1	A	O	-	-	-			63	40	17							
RG4015	BB2 WB1 VB1			-	-	-			61	42	16							
RG4016	BB2 WB1 VB2			-	-	-			66	62	39							
RG4017	BB2 WB1 HB1			O	.973	O			62	41	18							
RG4018	BB2 WB1 VB1 HB1	Y	Y	O	.922	O			65	68	37							
RG4019	BB2 WB1 VB1 HB2	A	O	O	.973	O			64	69	38							
									ANGLE OF ATTACK (ALPHA)									
		B		Se	$\bar{c}_{N/4}$	$\bar{c}_T$	$\bar{c}_{N/4}$		0	3	5	12	15					
RG4020	BB2 WB1 VB1 HB1	B	O	A	O	.67			71	77	81	86	89					
RG4021	BB2 WB1 VB2	B	-	-	-	.67			72	78	80	87	88					
RG4022	BB2 WB1 HB1	B	O	A	O	.67			73	76	82	85	90					
RG4023	BB2 WB1	B	-	-	-	.67			74	75	83	84	91					
									ELEVATOR DEFLECTION (ELEVATOR) Se									
		$\alpha$	B		$\bar{c}_{N/4}$	$\bar{c}_T$	$\bar{c}_{N/4}$		-30	-20	-10	0	10	20	30			
RG4024	BB2 WB1 VB1 HB1	A	O		A	O	.67		96	94	92	19	93	95	97			
RG4025	BB2 WB1 VB1 HB1	A	O		F	O	.67		102	100	98		99	101	103			

1 7 13 19 25 31 37 43 49 55 61 67 75 76

EA ICY KN KRL ICLM KYN

COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

IDPVAR(1) IDPVAR(2) NDV

$\bar{c}_{N/4} A = 2.973$  OF BODY LENGTH

$\bar{c}_{N/4} F = 0.927$  OF BODY LENGTH

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Attitude	Normal (lbs)	Pitching(in.lb)	Axial (lbs)
$\alpha = 90^\circ$	380		
$\alpha = 90^\circ$		890	
$\alpha = 0^\circ$ $\delta_e = -30^\circ$			25

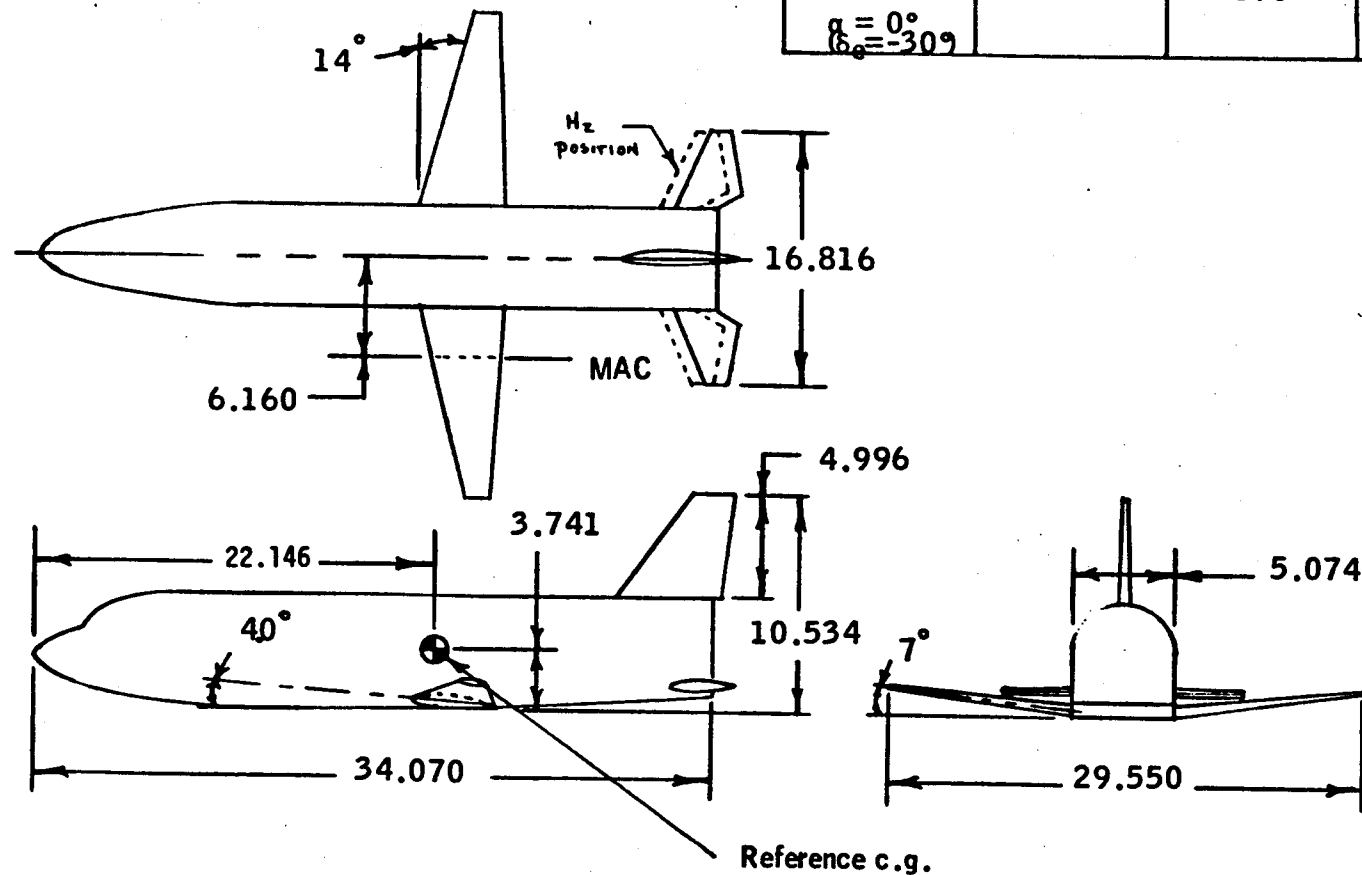
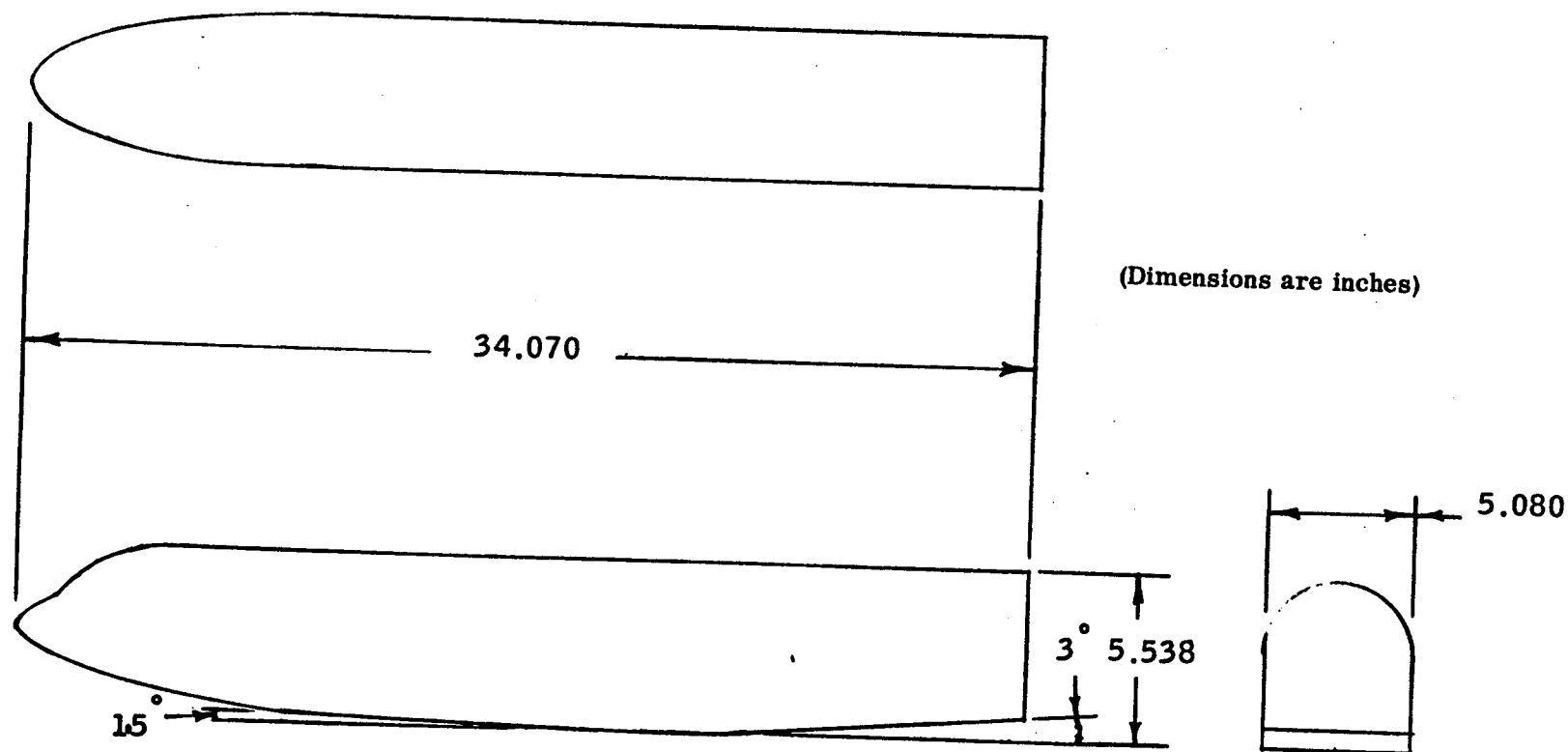


Figure 1.- Assembled model geometry and maximum loads. Configuration  $B_{B_1} W_{B_1} V_{B_1} H_{B_1}$   
(All dimensions in inches model values).

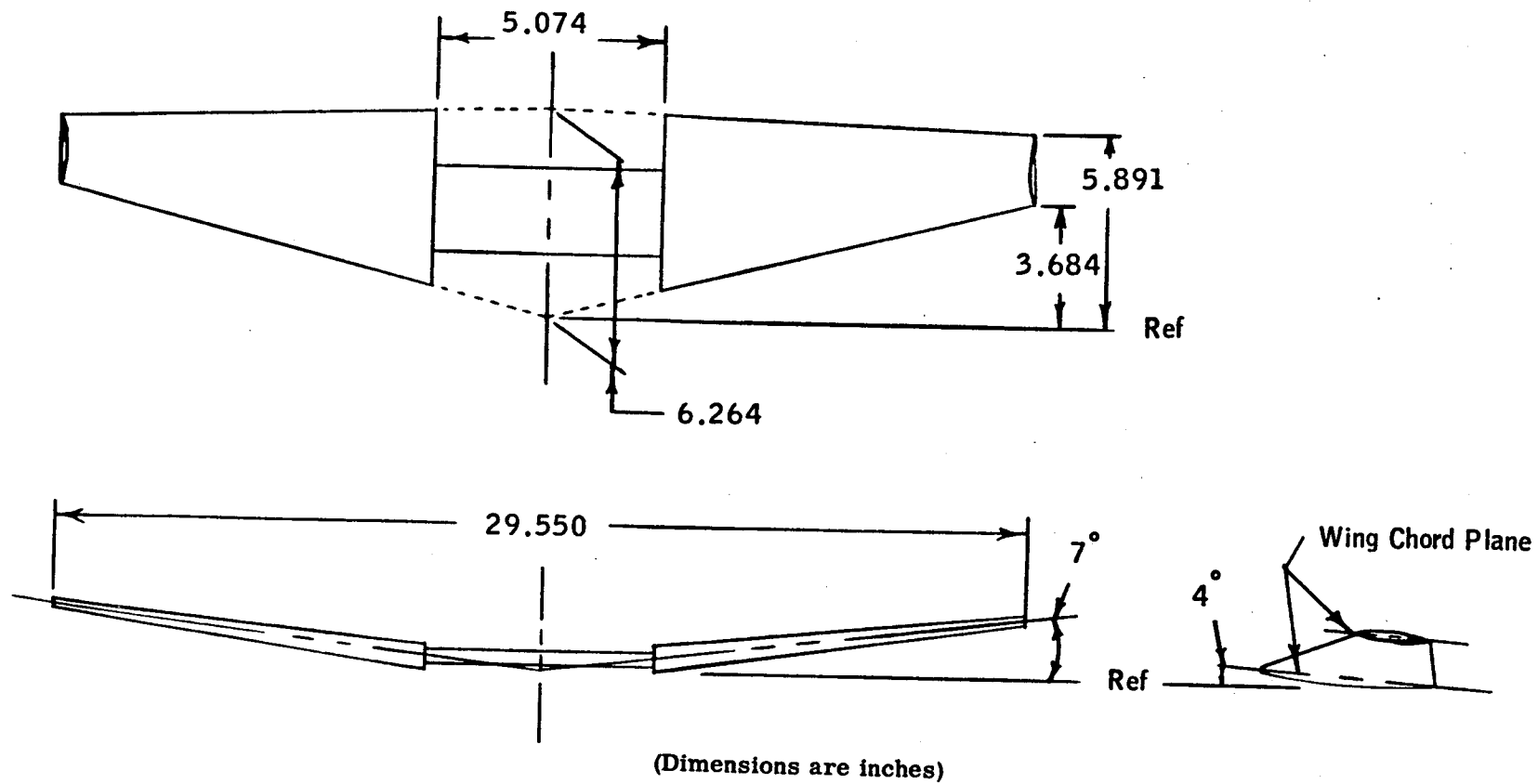
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STRAIGHT WING BOOSTER  
MSC  
DR#1033 A-1- 498



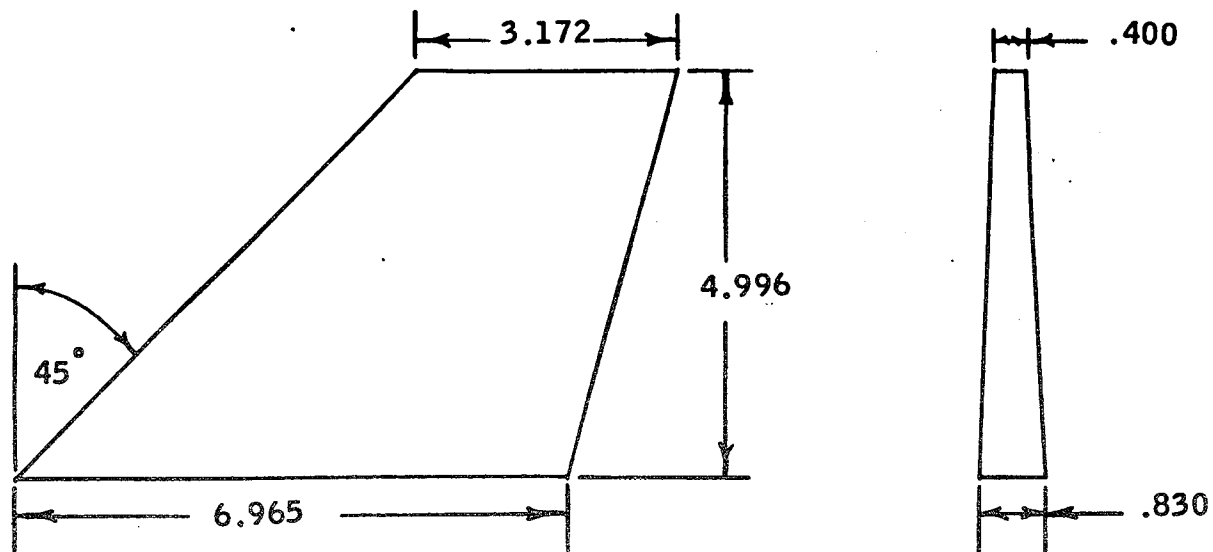
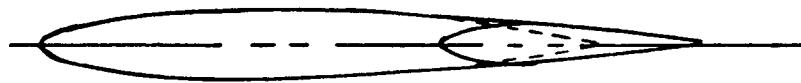
(a) Fuselage ( $B_{B_1}$ ) (Drawing number SEY37100310)

Figure 2.- Model components.



(b) Wing ( $W_{B1}$ ) (Drawing number SEY37100315)

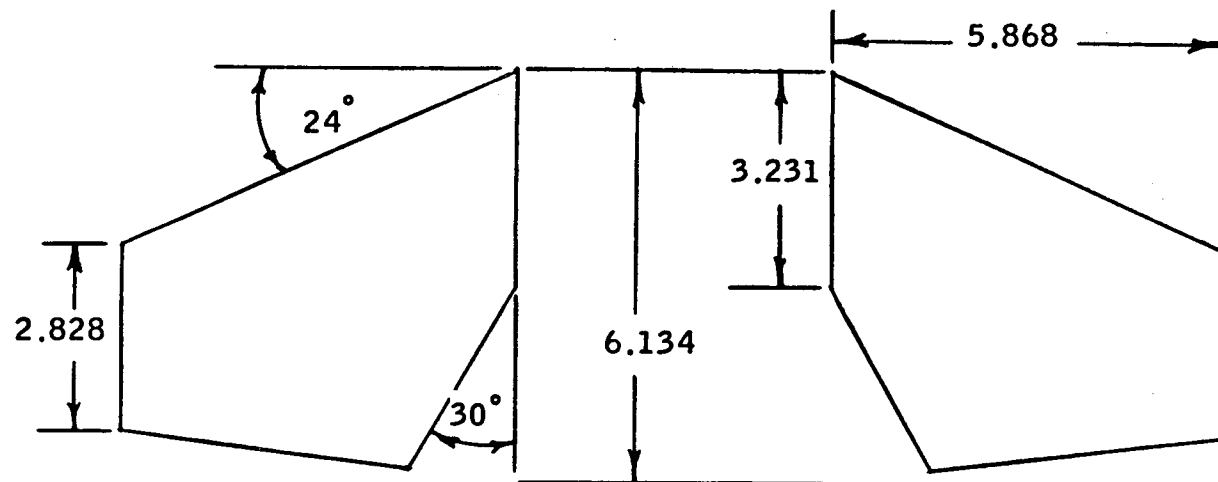
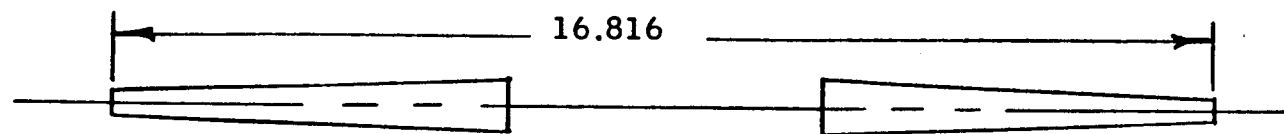
Figure 2.- Continued.



(Dimensions are inches)

(c) Vertical stabilizer ( $V_{B1}$ ) (Drawing number SEY 37100314)

Figure 2.- Continued.



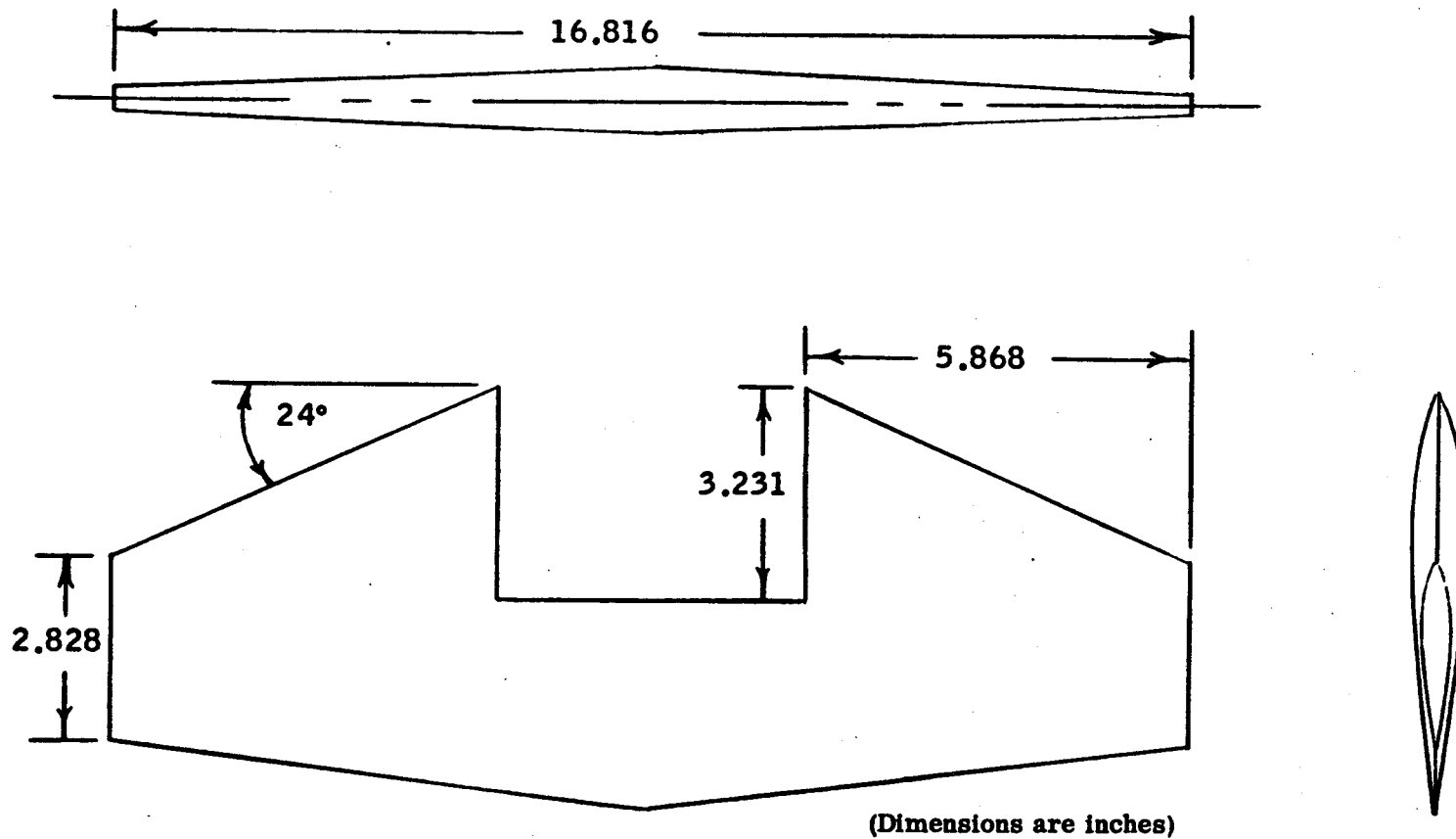
(Dimensions are inches)

(d) Horizontal stabilizer ( $H_{B1}$ ) (Drawing SEY37100316)

Figure 2.- Continued.







(e) Horizontal stabilizer (HB<sub>2</sub>)

Figure 2.- Concluded.

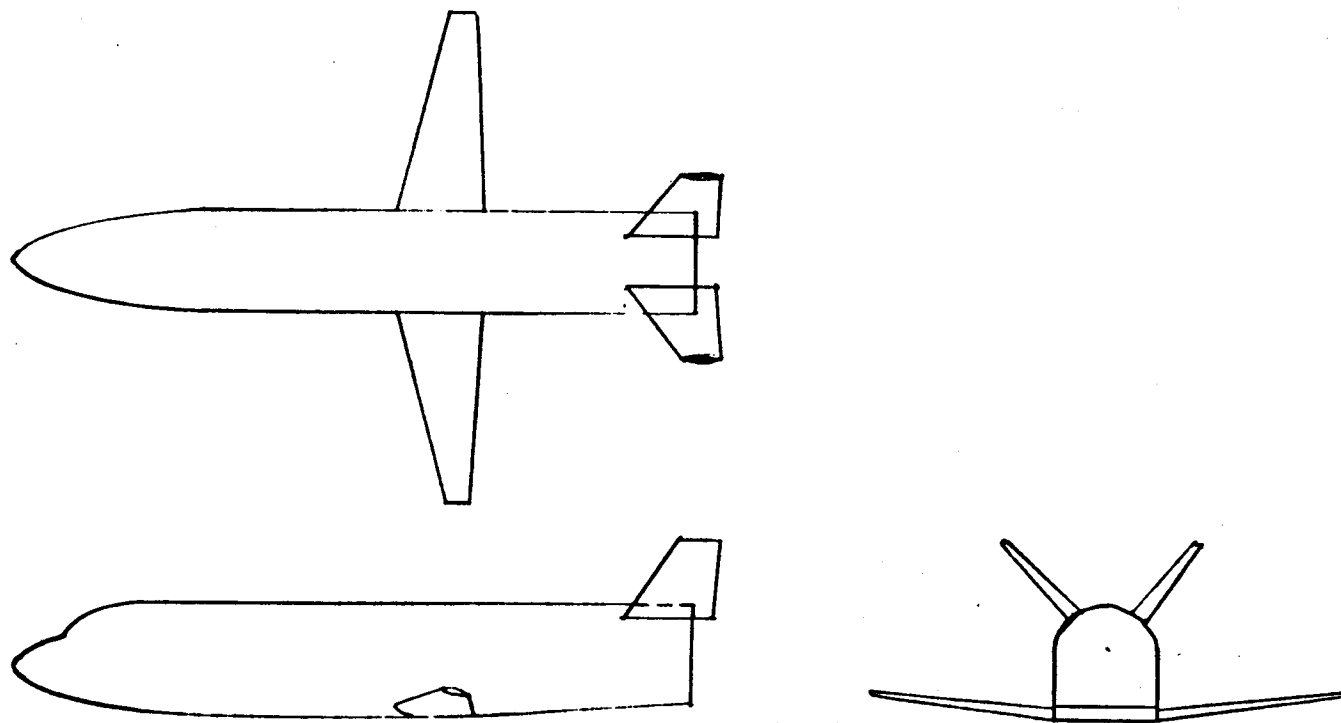
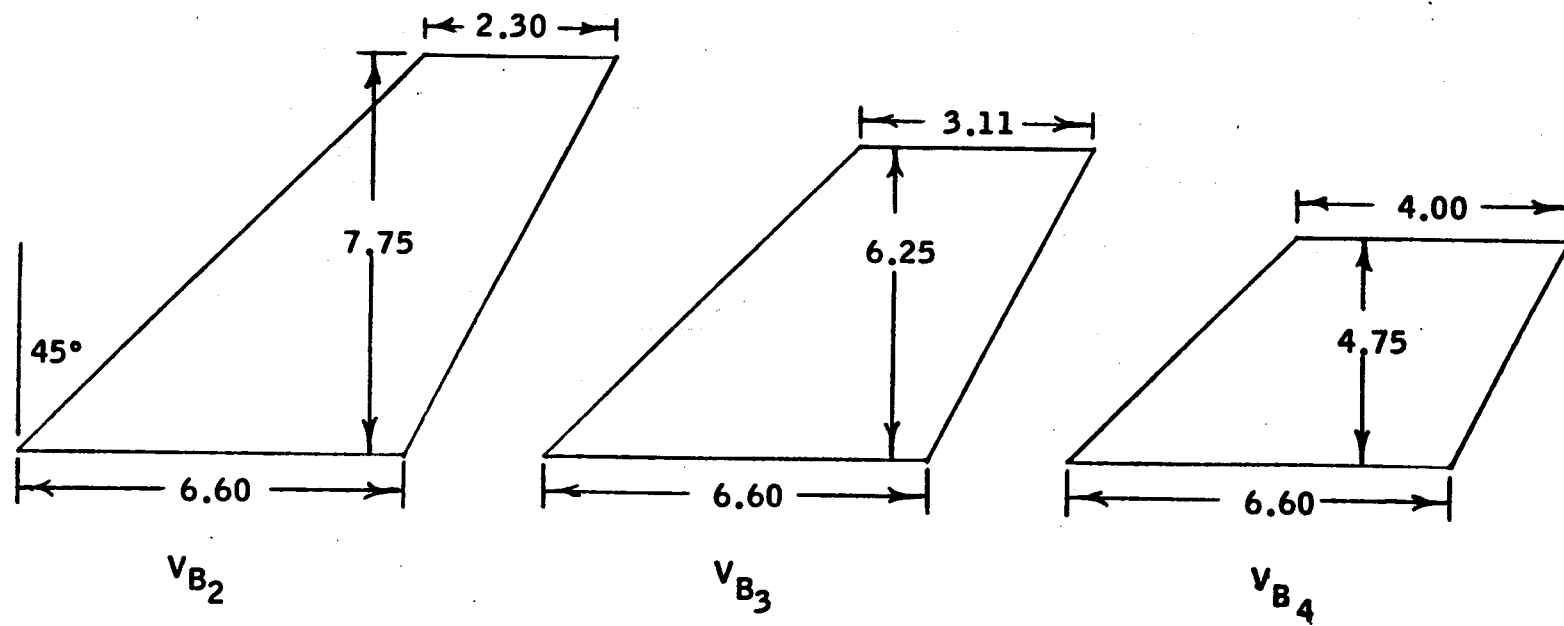


Figure 4. - General arrangement of "Vee" tail.



(Dimensions are inches)

Figure 4. - Concluded.

# TEST UWAL-1021 DATA SET COLLATION SHEET

SHEET 1 of 3

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		$\alpha$	$\beta$	$\delta_a$	$\delta_s$	$\delta_e$	$\delta_r$		0.10	0.15	0.26	0.29						
RUI011	B <sub>1</sub>	A	0°	-	-	-	-			005								
016	B <sub>1</sub>	0°	C	-	-	-	-			4								
026	B <sub>1</sub> N <sub>1</sub>	0°	C	-	-	-	-			7								
021	B <sub>1</sub> N <sub>1</sub>	A	0°	-	-	-	-			6								
031	B <sub>1</sub> W <sub>1</sub> N <sub>1</sub>	A	0°	0°	-	-	-			12								
041	B <sub>1</sub> H <sub>1</sub> N <sub>1</sub>	A	0°	-	0°	0°	-			8								
051	B <sub>1</sub> V <sub>1</sub> N <sub>1</sub>	A	0°	-	-	-	0°			9								
056	B <sub>1</sub> V <sub>1</sub> N <sub>1</sub>	0°	C	-	-	-	0°			10								
061	B <sub>1</sub> W <sub>1</sub> V <sub>1</sub> N <sub>1</sub>	A	0°	0°	-	-	0°			13								
076	B <sub>1</sub> W <sub>1</sub> H <sub>1</sub> N <sub>1</sub>	0°	C	0°	0°	0°	-			15								
071	B <sub>1</sub> W <sub>1</sub> H <sub>1</sub> N <sub>1</sub>	A	0°	0°	0°	0°	-			14								
081	B <sub>1</sub> W <sub>1</sub> H <sub>1</sub> V <sub>1</sub>	A	0°	0°	0°	0°	0°			17								
086	B <sub>1</sub> W <sub>1</sub> H <sub>1</sub> V <sub>1</sub>	0°	C							16								
091	B <sub>1</sub> W <sub>1</sub> H <sub>1</sub> V <sub>1</sub> N <sub>1</sub>	A	0°							18								
A91		A	0°						20									
095		B	0°								22							
A95		B	0°									21						
093		A	-10°							23								
09A		0°	D							24								
097		10°	C							25								

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CL	CD	CLM	CLN	CLY	CSL	CDB							

COEFFICIENTS:

$\alpha$  or  $\beta$   
SCHEDULES

A) -8° → 32°,  $\Delta\alpha = 2^\circ$

B) -8° → 14°,  $\Delta\alpha = 2^\circ$

C) -4° → 10°,  $\Delta\beta = 2^\circ$

D) -10° → 10°,  $\Delta\beta = 2^\circ$

IDPVAR(1) IDPVAR(2) NDV

STRAIGHT WING BOOSTER

TBC

DR#1079 A-1- 505

TEST UNAL-1021 DATA SET COLLATION SHEET

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 506

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		a	B	$\delta_a$	$\delta_s$	$\delta_c$	$\delta_r$		0.10	0.15	0.26	0.29						
RU1098	B, W, H, V, N,	20	C	0°	0°	0°	0°			26								
099	B, W, H, V, N,	32	C	0°	0°	0°	0°			27								
101	B, W, H, V, N, F, 15	A	0°							42								
104	B, W, H, V, N, F, 15	A	-10°							41								
141	B, W, H, V, N, F, 40	A	0°							38								
142			-4°							39								
144			-10°							40								
151			0°		-20°					29								
171					10°					37								
181	B, W, H, V, N,				-20°					28								
201					10°					36								
211					0°	-30°				44								
241					0°	30°				43								
291	B, W, H, V, N, F, 40				-20°	-30°				30								
321					-20°	30°				31								
331	B, W, H, V, N,				-20°	30°				32								
341					10°	30°				35								
351					10°	-30°				34								
361					-20°	-30°				33								

1 7 13 19 25 31 37 43 49 55 61 67 75.76  
CL CD CLM CLN CY CSL COB

COEFFICIENTS:

a or B

SCHEDULES

A) -8° → 32°, Δα = 2°

B) -8° → 10°, Δα = 2°

C) -4° → 10°, Δβ = 2°

D) -10° → 10°, Δβ = 2°

IDPVAR(1) IDPVAR(2) NDV

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SHEET 3 of 3

**☐ PRETEST**

☒ POSTTEST

[illegible]

**COEFFICIENTS:**

**$\alpha$  or  $\beta$**

## SCHEDULES

A)  $-8^\circ \rightarrow 32^\circ$   $\Delta \alpha = 2^\circ$

B)  $-1^\circ \rightarrow 14^\circ \quad \Delta x = 2^\circ$

c)  $-4^\circ \rightarrow 10^\circ \Delta\beta = 2^\circ$

D)  $-10^\circ \rightarrow 10^\circ$ ,  $\Delta\beta = 2^\circ$

→ IDPVAR(1) | IDPVAR(2) | NDV

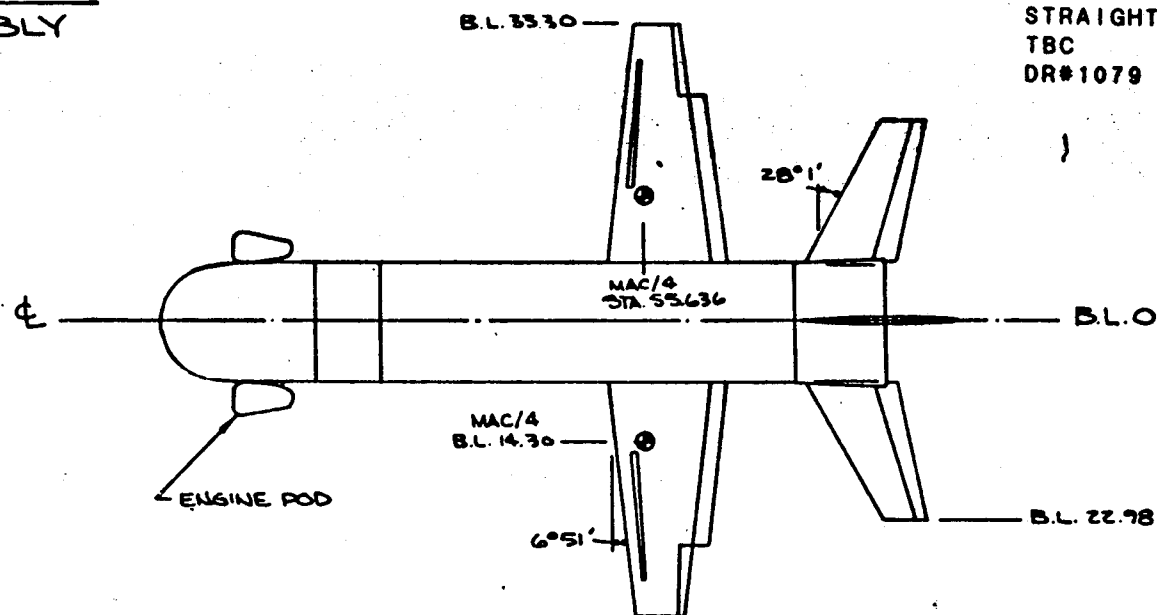
## STRAIGHT WING BOOSTER

TBC

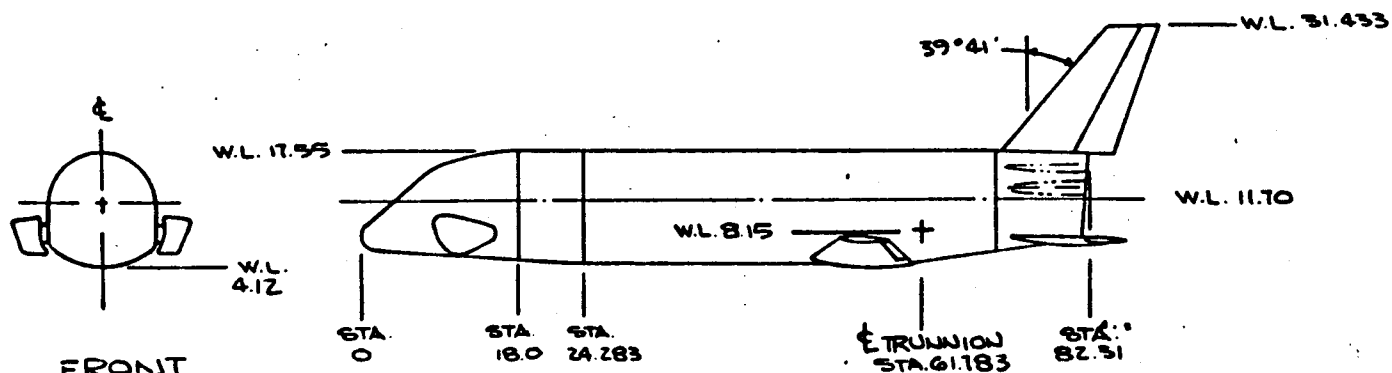
DR# 1079      A-1- 507

AX 1193E-2  
ASSEMBLY

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 508



PLAN VIEW



FRONT VIEW

SIDE VIEW

FIGURE 2. AX 1193E-2 ASSEMBLY

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AX 1193E-2  
(ASSEMBLY PLAN VIEW)

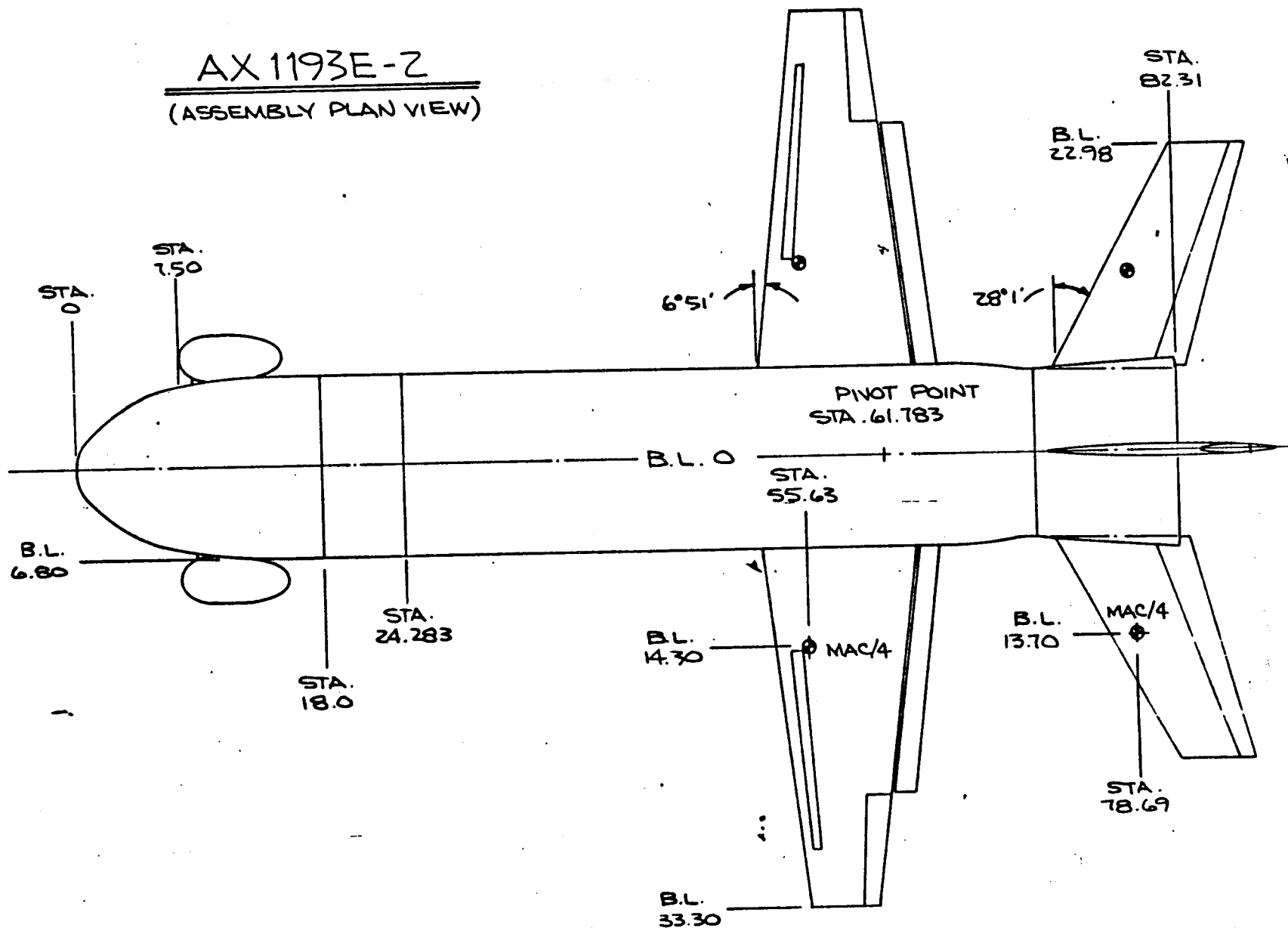


FIGURE 3. PLAN VIEW B, W, V, H, N, S, + F,

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 509



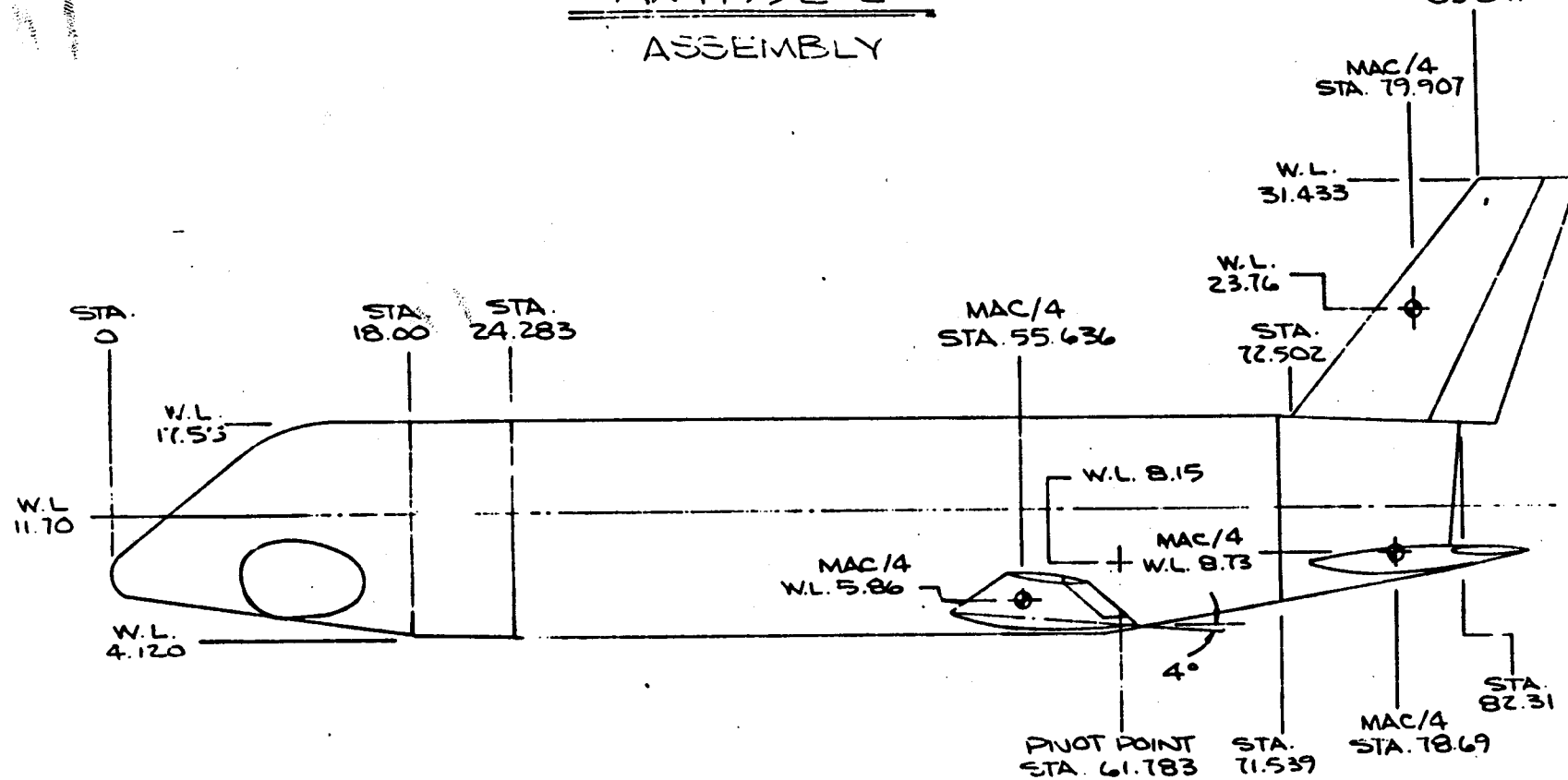
AX 1193E-2

ASSEMBLY

STRAIGHT WING BOOSTER

TBC

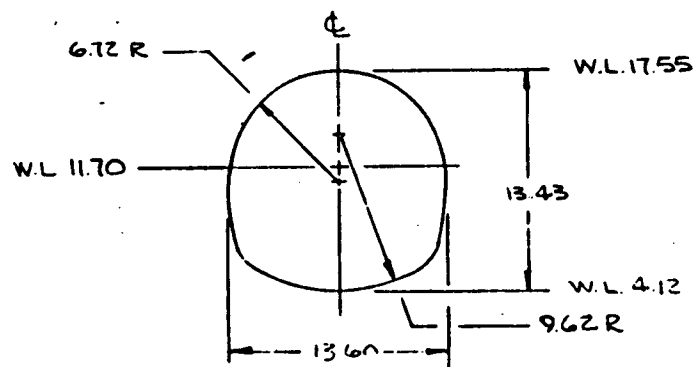
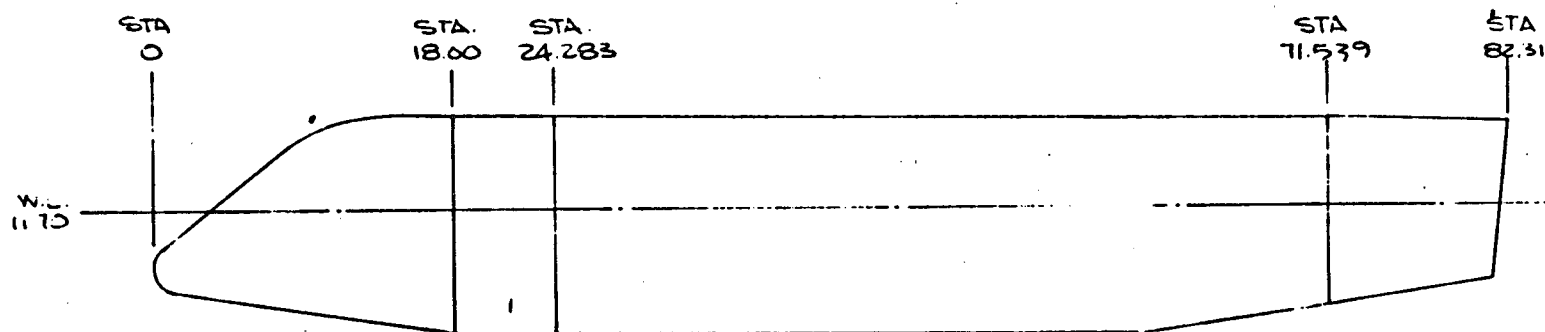
DR#1079 A-1- 510 STA. 83.841



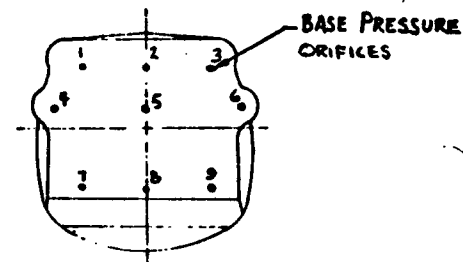
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FIGURE 4. SIDE VIEW B, W, V, H, N,

# AX 1193E-Z BODY, B<sub>1</sub>



SECTION  
@ STA. 24.283



REAR VIEW

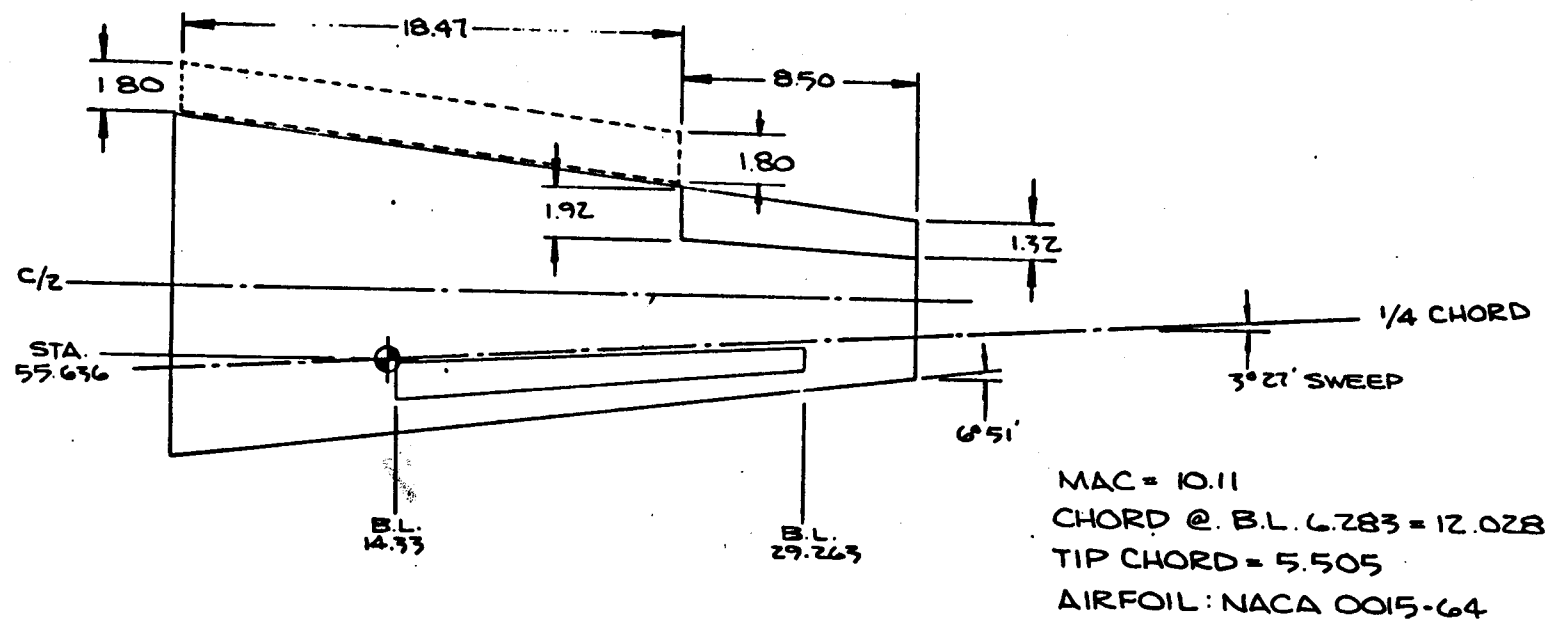
FIGURE 5. Body B<sub>1</sub>

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 511

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 512

# AX 1193E-Z, C<sub>6</sub> WING, W<sub>2</sub>

REF: 29-4610Z



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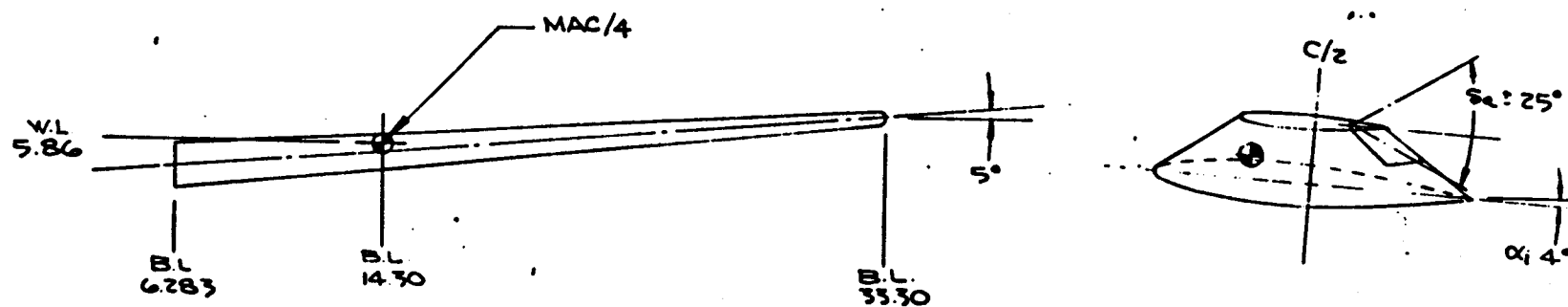


FIGURE 6. WING- W<sub>1</sub>, W<sub>2</sub>

# AX 1193E-2, HORIZ. TAIL H<sub>1</sub>

REF: 29-46103

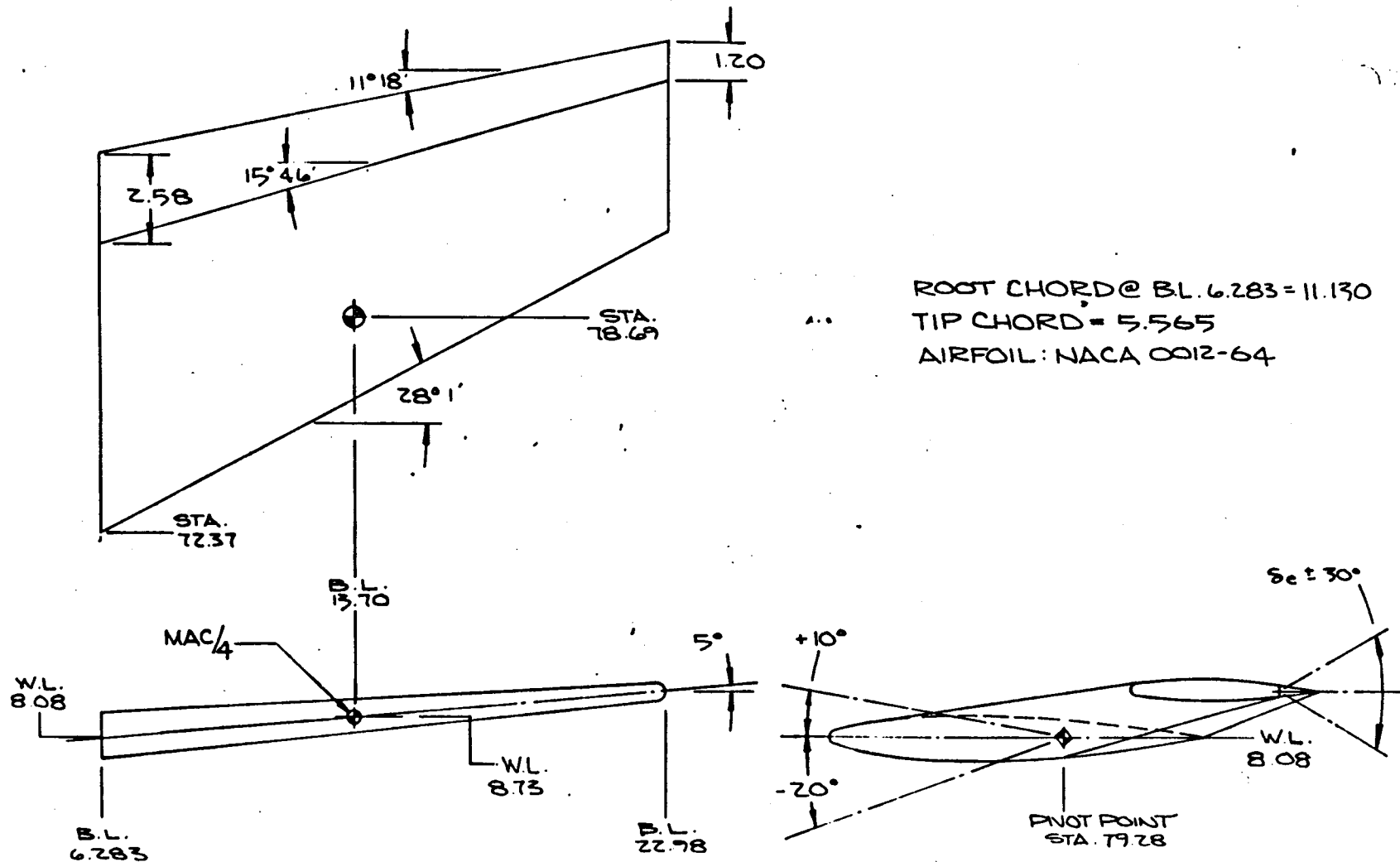


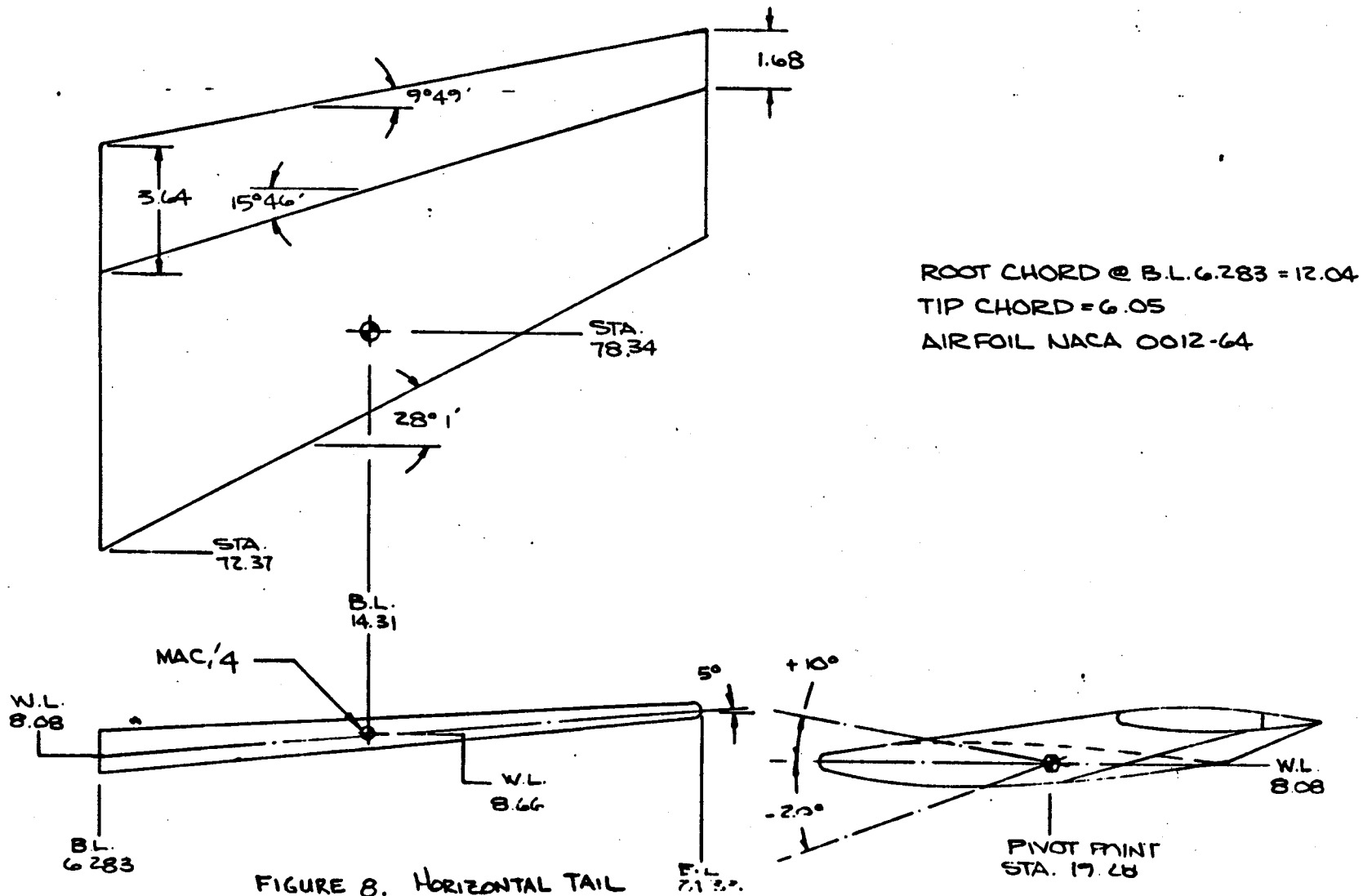
FIGURE 7. HORIZONTAL TAIL, H<sub>1</sub>

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 513

# AX1193E-2, HORIZ. TAIL H<sub>2</sub>

REF DWG. Z9-46148

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 514



608

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 516

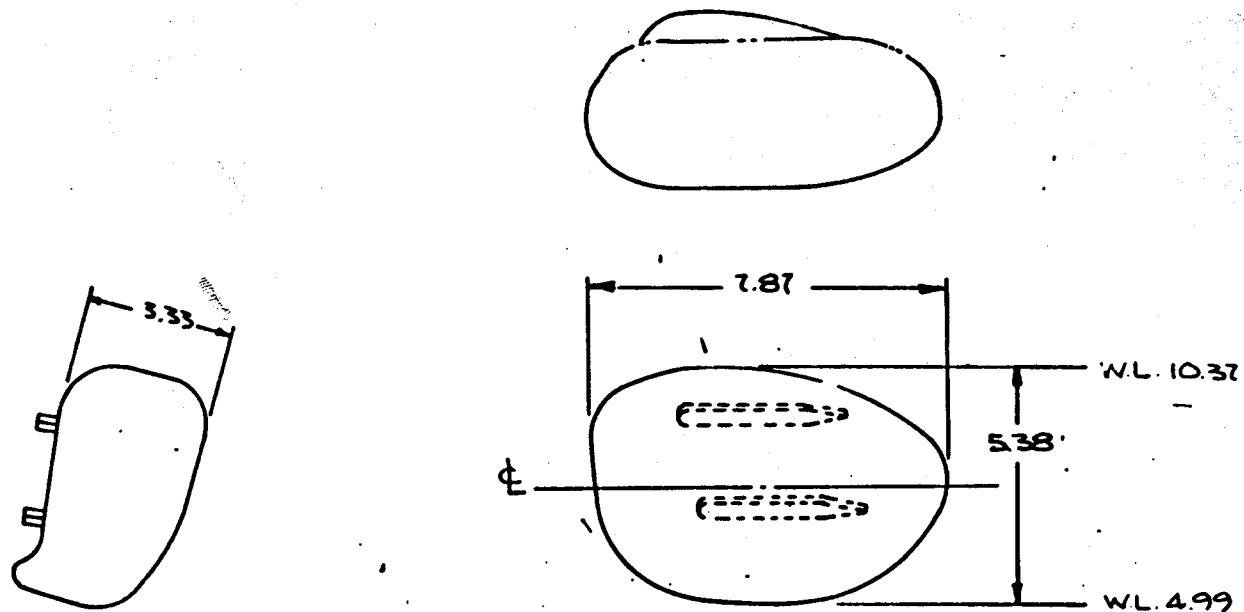
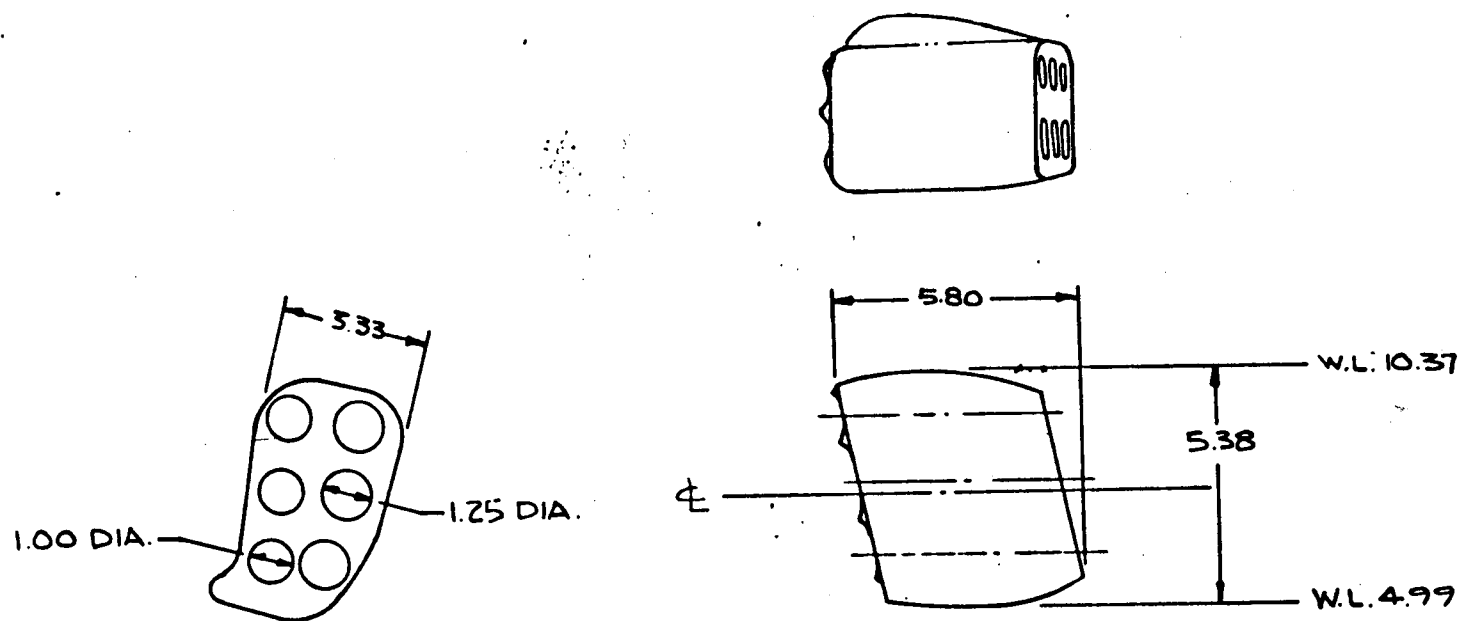


FIGURE 10. <sup>N<sub>1</sub></sup>  
ENGINE POD  
REF: DWG. 1193-46



N<sub>2</sub>  
FIGURE 11. ENGINE POD  
 REF: DWG 1193-50



# AX 1193E-2 FLAP PROFILE AND POSITIONS

REF: 1193-31

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 518

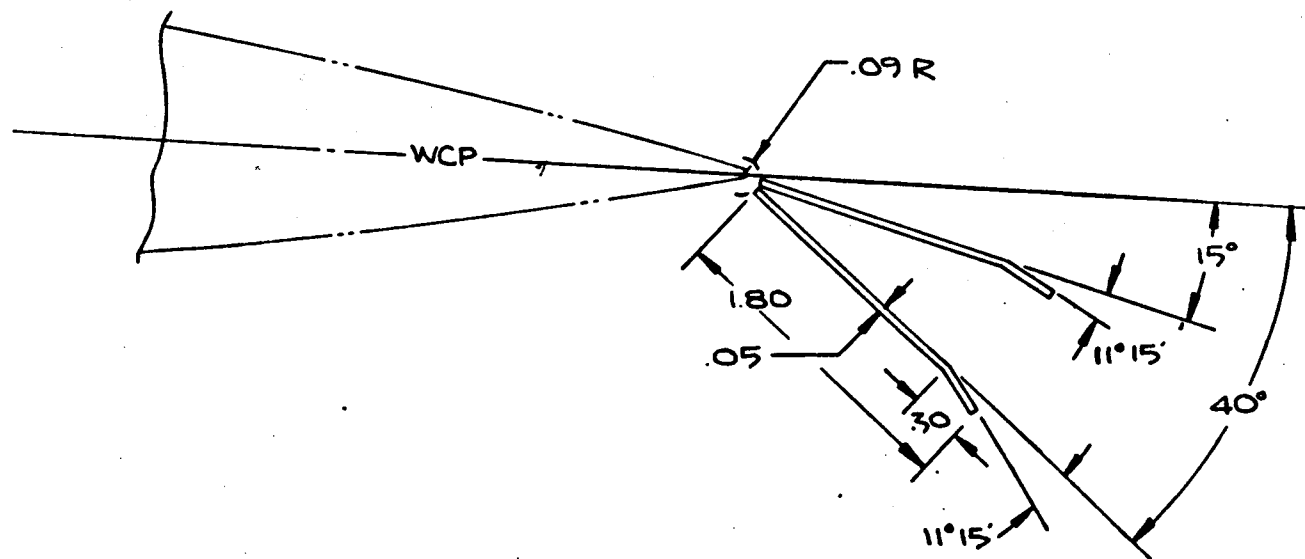
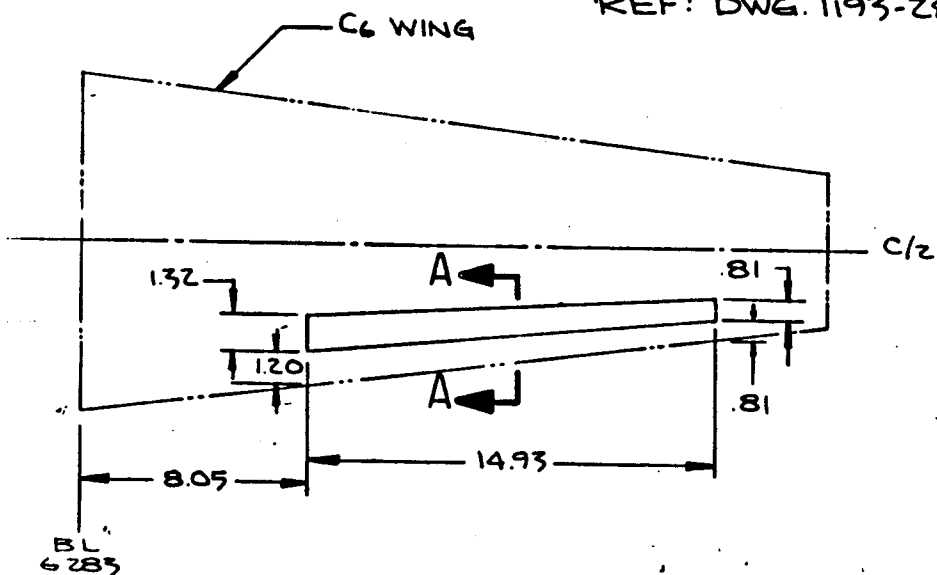


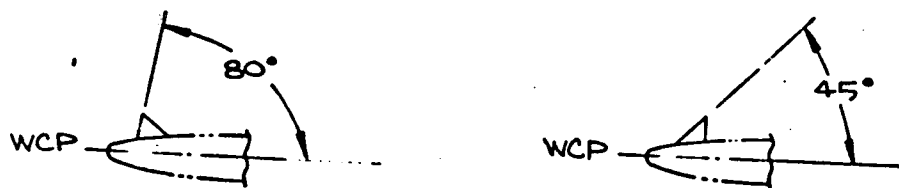
FIGURE 12. SIMULATED FOWLER FLAP,  $F_1$

# AX 1193E-Z SPOILER SECTION AND LOCATION

REF: DWG. 1193-Z8



NOTE: SPOILER DIMENSIONS  
GIVEN AT 0° DEFLECTION.



SECTION A-A

FIGURE 13. WING SPOILER, S<sub>1</sub>

STRAIGHT WING BOOSTER  
TBC  
DR#1079 A-1- 519

TABLE I.  
TEST ARC 66-550 DATA SET COLLATION SHEET

STRAIGHT WING BOOSTER  
TBC  
DR#1111 A-1- 520

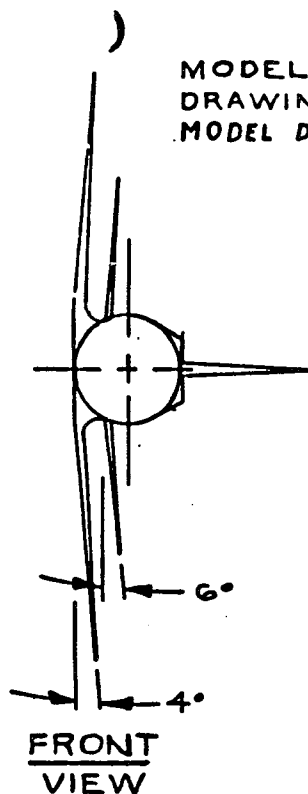
☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)											
		a	B	$\alpha_1$	$\alpha_2$				.3	.6	.75	.8	.9	1.2	1.3	1.5	2.0			
K67-511	B <sub>3</sub> W <sub>4</sub> H <sub>4</sub> V <sub>5</sub>	A	0°	0°	0°			7	2	8	7	6		5		4	3			
021	B <sub>3</sub> W <sub>4</sub>			—	—			3	11	10		9								
031	B <sub>3</sub>	A	0°	—	—			3	14	13		12								
014	B <sub>3</sub> W <sub>4</sub> H <sub>4</sub> V <sub>5</sub>	J	C	0°	0°			6	23	22		21		20		19	18			
024	B <sub>3</sub> W <sub>4</sub>			—	—			2	24			1								
034	B <sub>3</sub>	0°	C	—	—			5	17	16		15								
065	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>	17	C	-25°	0°			6		30		29	23		27	26	25			
065	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>	B	0°	-20°	0°			7	31	37		36	25		34	33	32			
073	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>			-26°	-30°			5	48	47										
082	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>			0°	-30°			6	51	49					46	45	44			
093	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>			0°	0°			7	61	60		59	58		57	56	55			
103	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>			0°	30°			3	64	63			62							
113	B <sub>4</sub> W <sub>4</sub>			—	—			6	70	69			68		67	66	65			
123	B <sub>4</sub>			—	—			4	76	75			74		73	72	71			
133	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>			10°	0°			3	79	75			77							
143	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>			-26°	0°			5							94	93	92			
153	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>			-26°	0°			6	85	84			83		82	81	80			
163	B <sub>4</sub> H <sub>4</sub>							6	91	90			89		88	87	86			
173	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>							6	93	92			91		90	89	88			
183	B <sub>4</sub> W <sub>4</sub> H <sub>4</sub>	3	0°	-20°	0°			3	95	96			97		98	99	100			

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1	7	13	19	25	31	37	43	49	55	61	67	73	79
CN	ICA	ICM	ICX	ICL	CYH								
COEFFICIENTS:													
a or B													
SCHEDULES													
021: -15° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0° 031: -15° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0° 065: -20° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0° 0°													
IDPVAR(1) IDPVAR(2) NDV													

NASA-MPC-148



MODEL ASSEMBLY  
DRAWING 25-56543  
MODEL DIMENSIONS IN INCHES

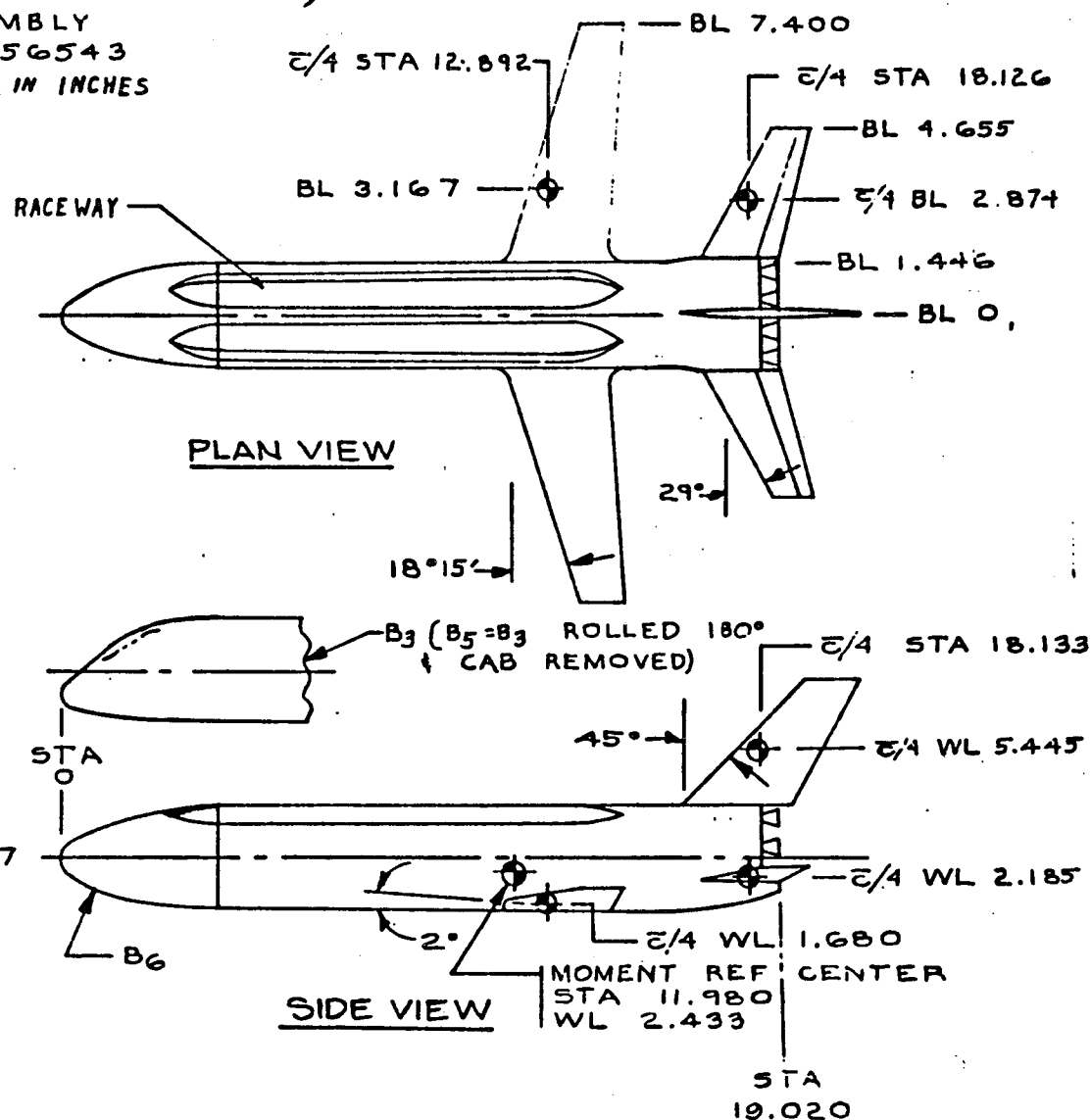
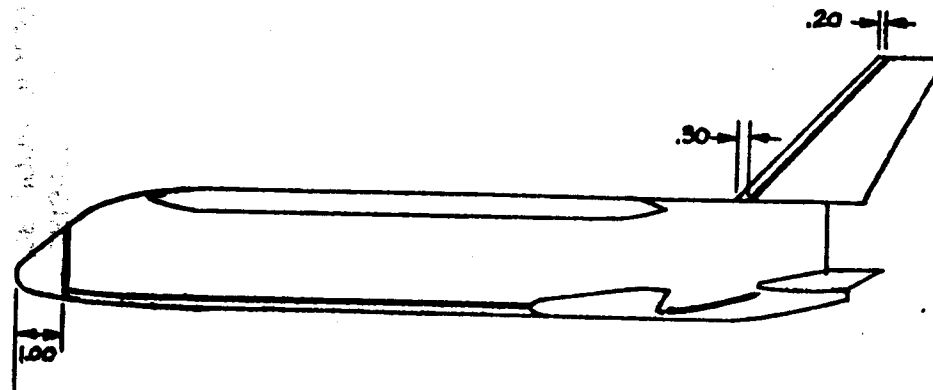


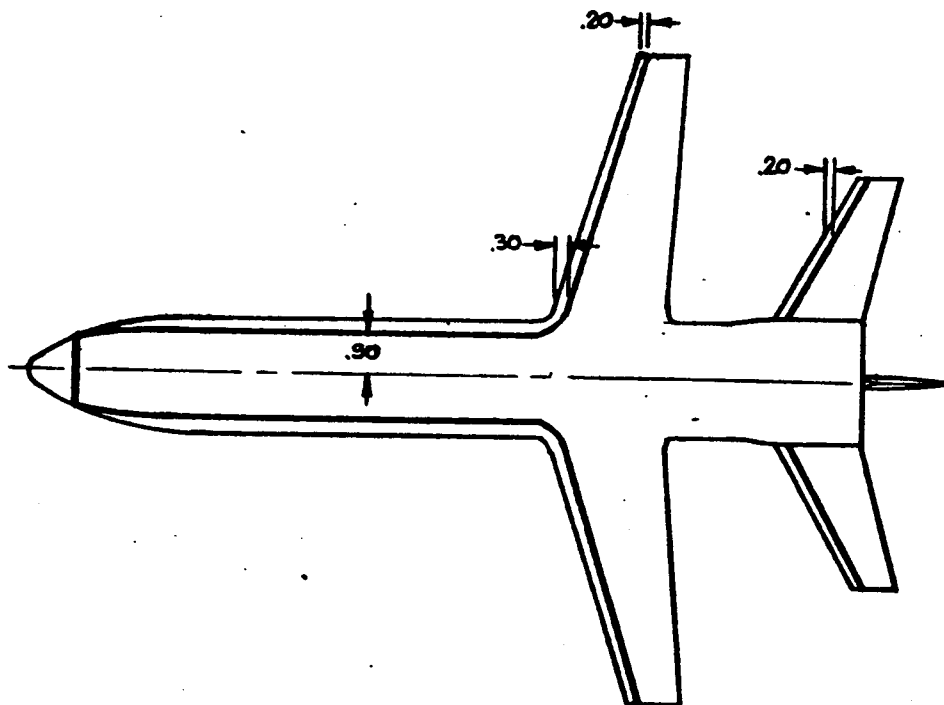
Figure B. Model Three View

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STRAIGHT WING BOOSTER  
TBC  
DR#1111 A-1- 522



BASE PRESSURE LOCATIONS



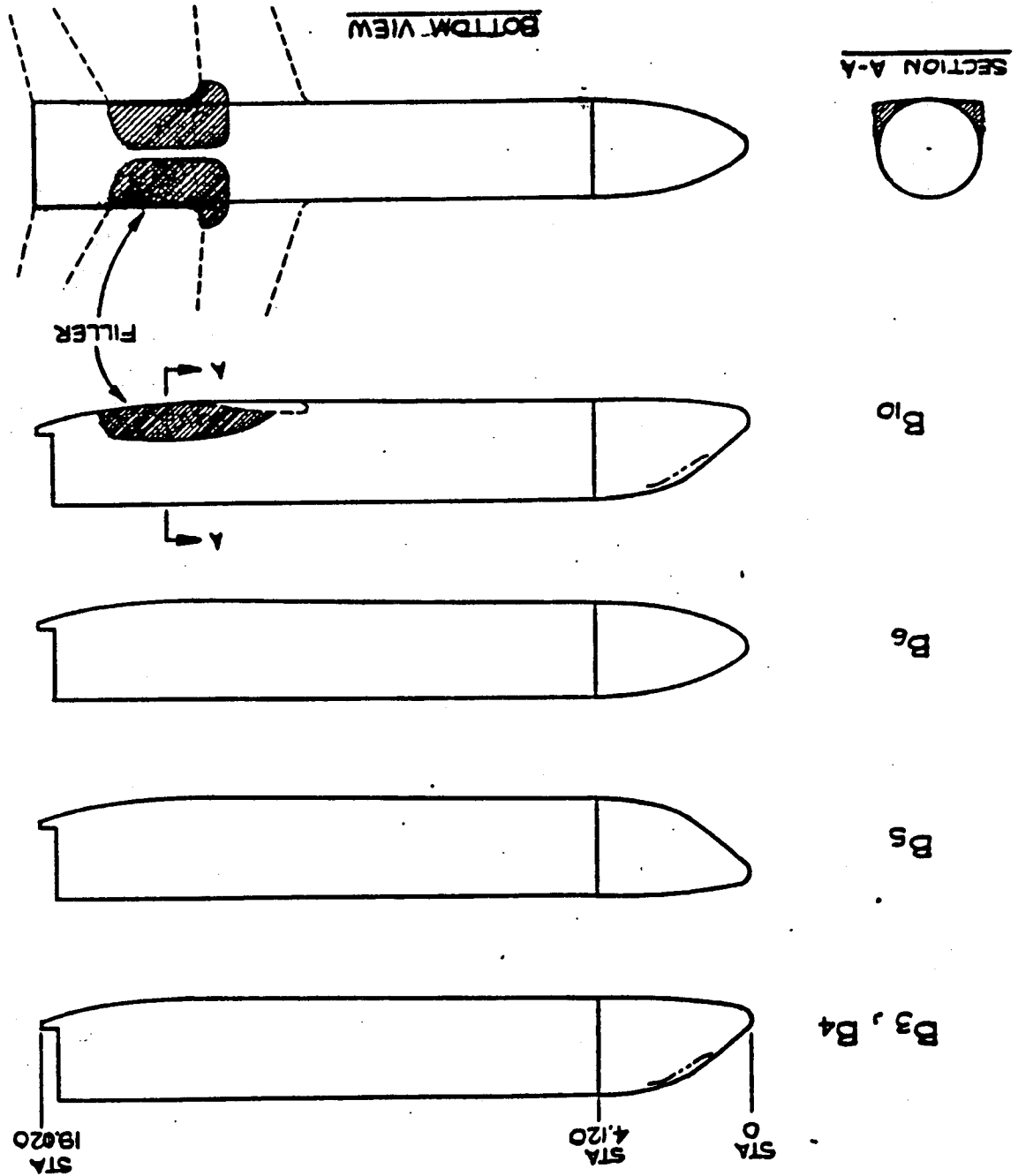
NOSE, WING, TAILS: 100 GRIT,  
.10" WIDE, 100-150/IN.  
FUSELAGE: 60 GRIT, .10" WIDE,  
60-80/IN.

ALL DIMENSIONS IN INCHES

Figure D.- Location of Trip Strips and Base Pressure Taps

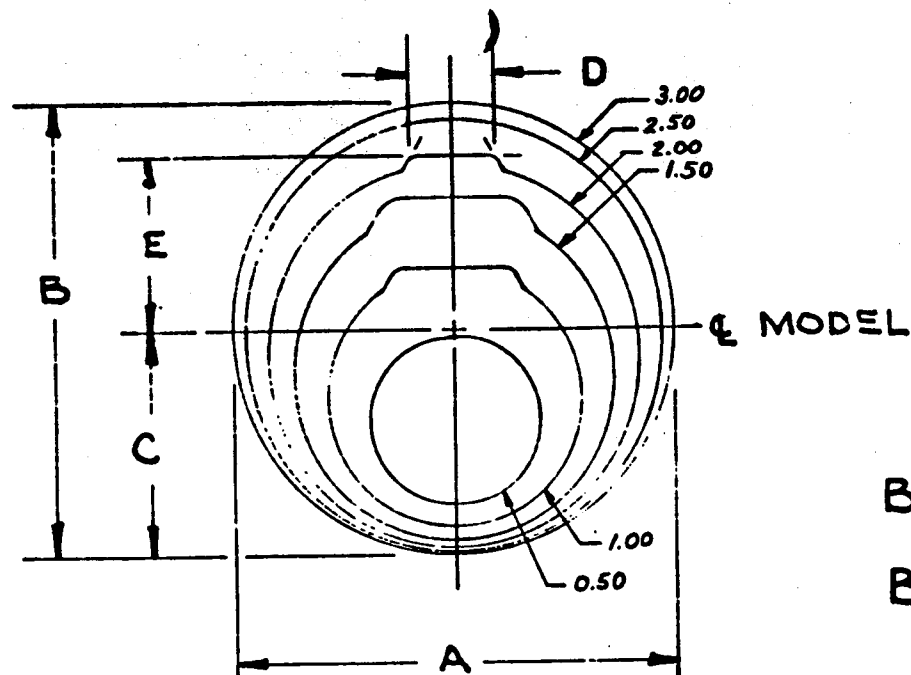
ORIGINAL PAGE IS  
OF POOR QUALITY

Figure E. Model Bodies, B<sub>3</sub>, B<sub>4</sub>, B<sub>5</sub>, B<sub>6</sub>, B<sub>10</sub>



STRAIGHT WING BOOSTER  
TBC  
DR#1111 A-1- 523

STRAIGHT WING BOOSTER  
TBC  
DR#1111 A-1- 524



NOSE  
CONTOUR  
 $B_3, B_4, \& B_{10}$

$B_5$  IDENTICAL  
EXCEPT NO CAB  
& INVERTED

$B_6$  SYM CONTOUR

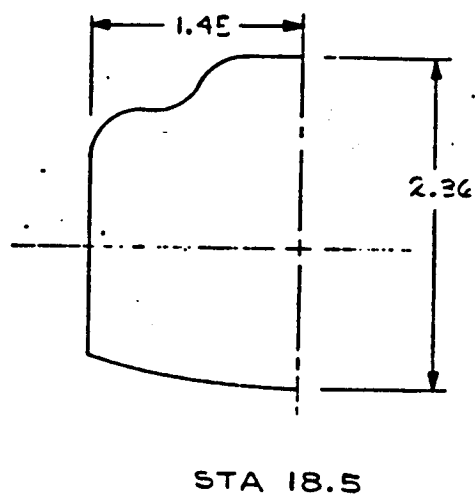
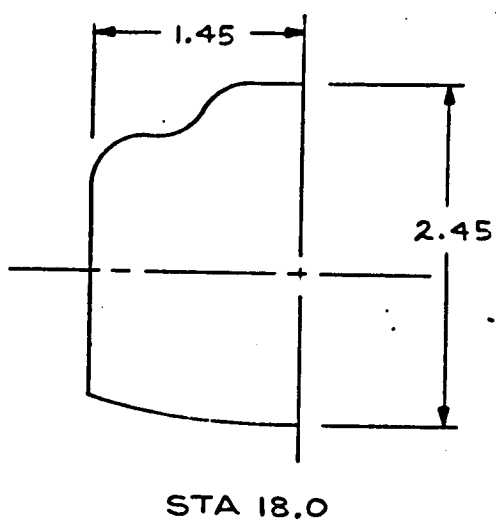
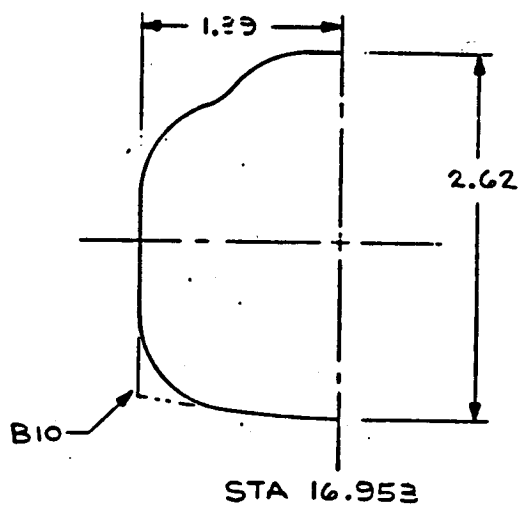
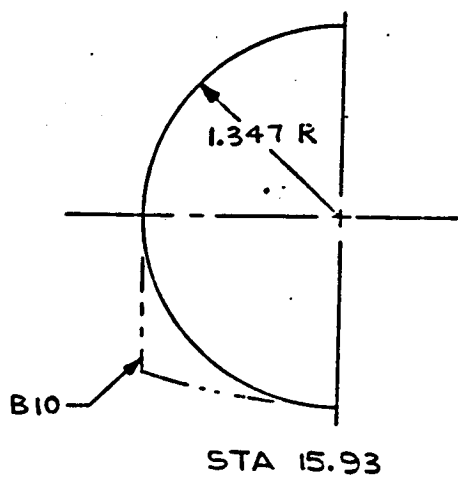
$B = A$   
 $C = A/2$

STA	A	B	C	D	E
0.50	1.04	0.99	1.03	-	-
1.00	1.54	1.52	1.16	0.72	0.36
1.50	1.96	1.94	1.24	0.82	0.78
2.00	2.28	2.26	1.30	0.52	1.03
2.50	2.41	2.50	1.33	-	-
3.00	2.53	2.59	1.34	-	-
3.50	2.58	2.657	1.347	-	-
4.00	2.65	2.677	1.347	-	-
4.12 4.1293	2.694	2.694	1.347	-	-

Model Dimensions in Inches

Figure F. Fore Body Sections

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AFT BODY CONTOURS  
(B3, B4, B5, B6, B10)

Model Dimensions in Inches

Figure G. Aft Body Sections



Model Dimensions in Inches

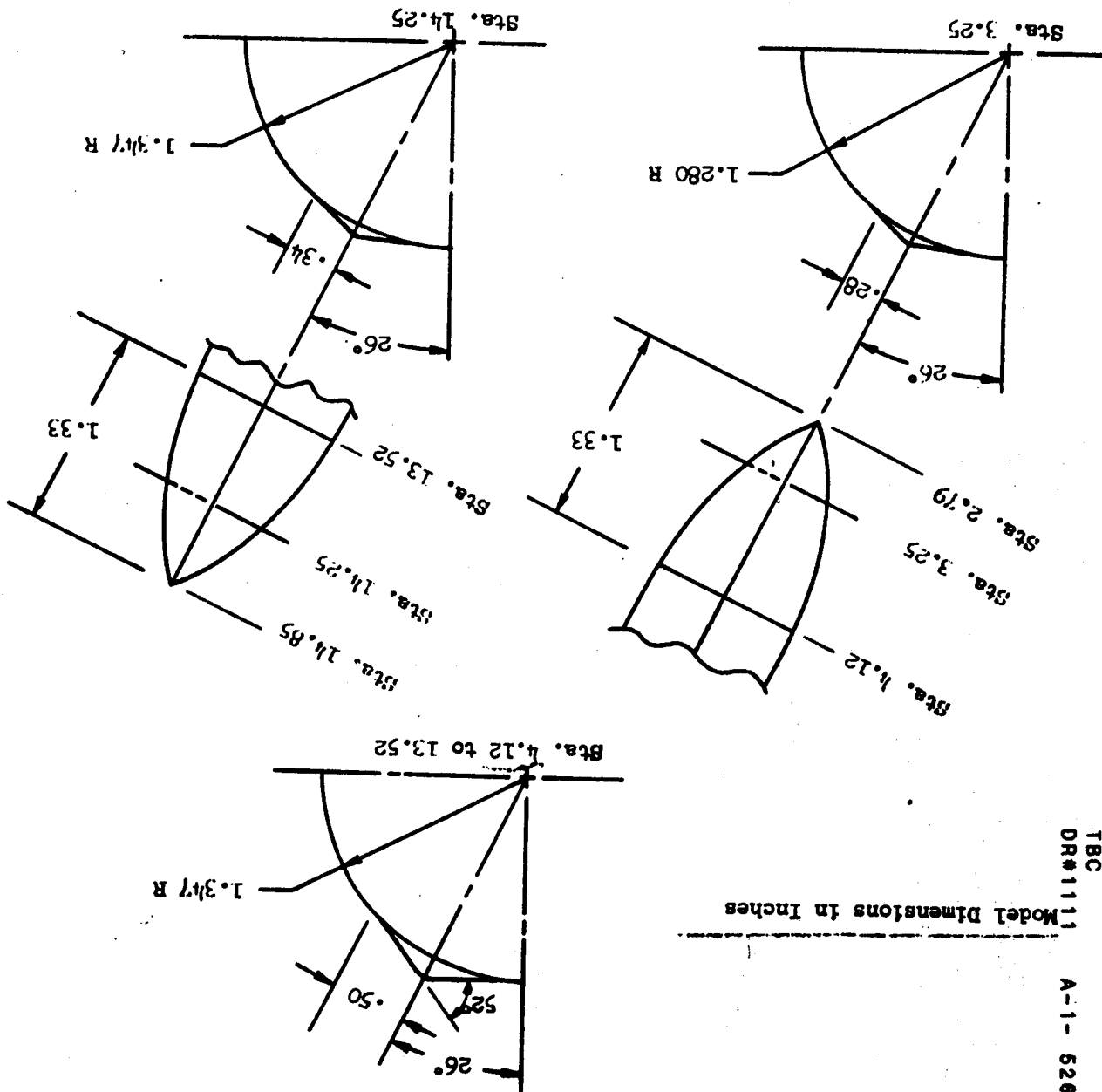
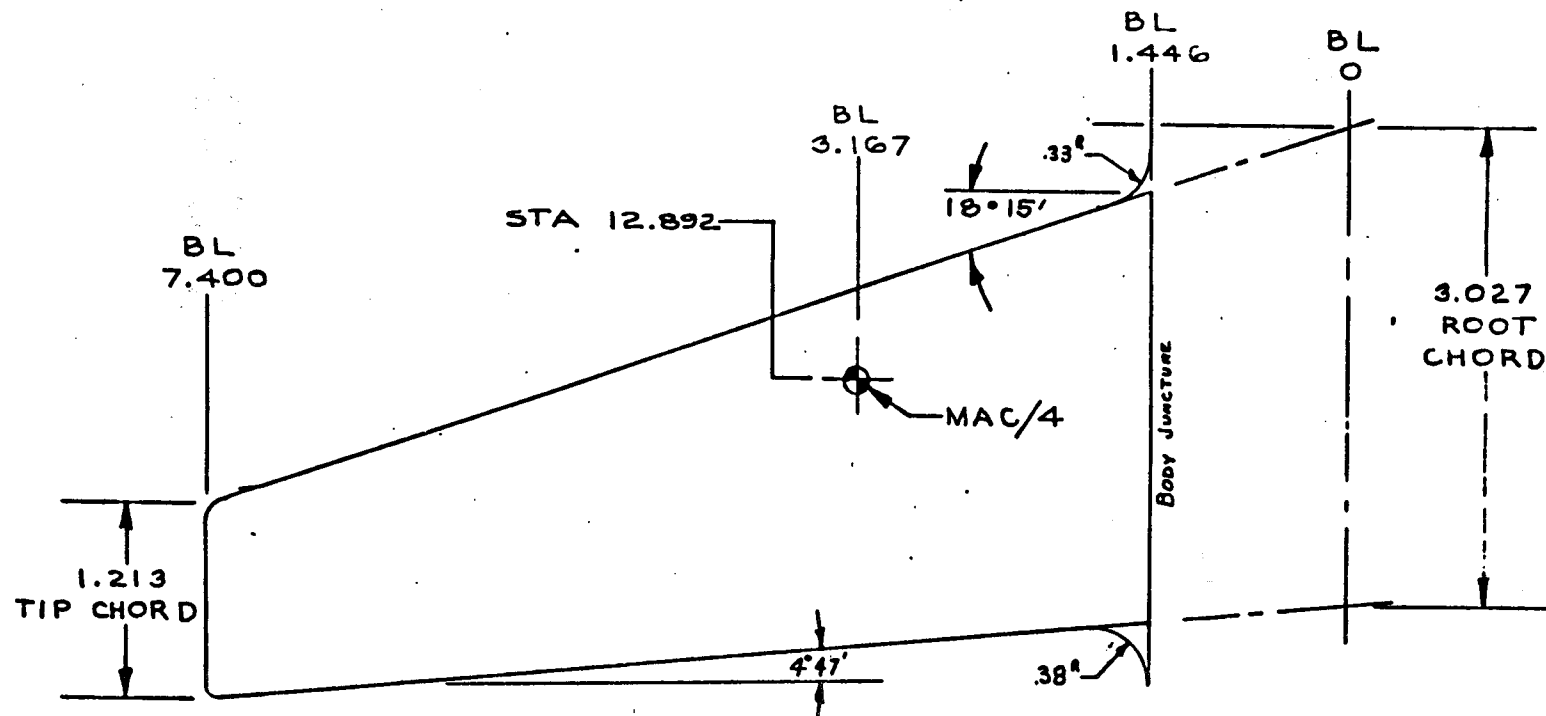


Figure 8. Raceway Details

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Model Dimensions in Inches

AIRFOIL NACA 0015-G4  
 MAC = 2.240  
 INCIDENCE ANGLE 2°  
 WITH RESPECT TO BODY  $\xi$

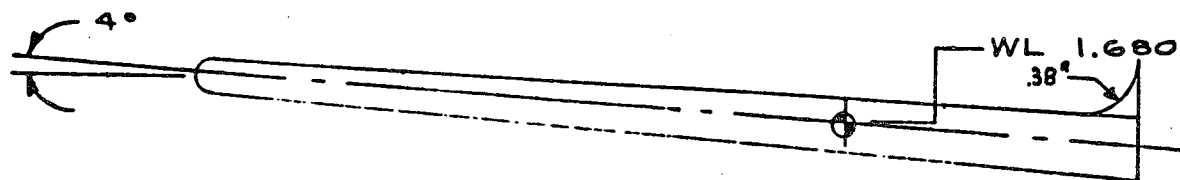
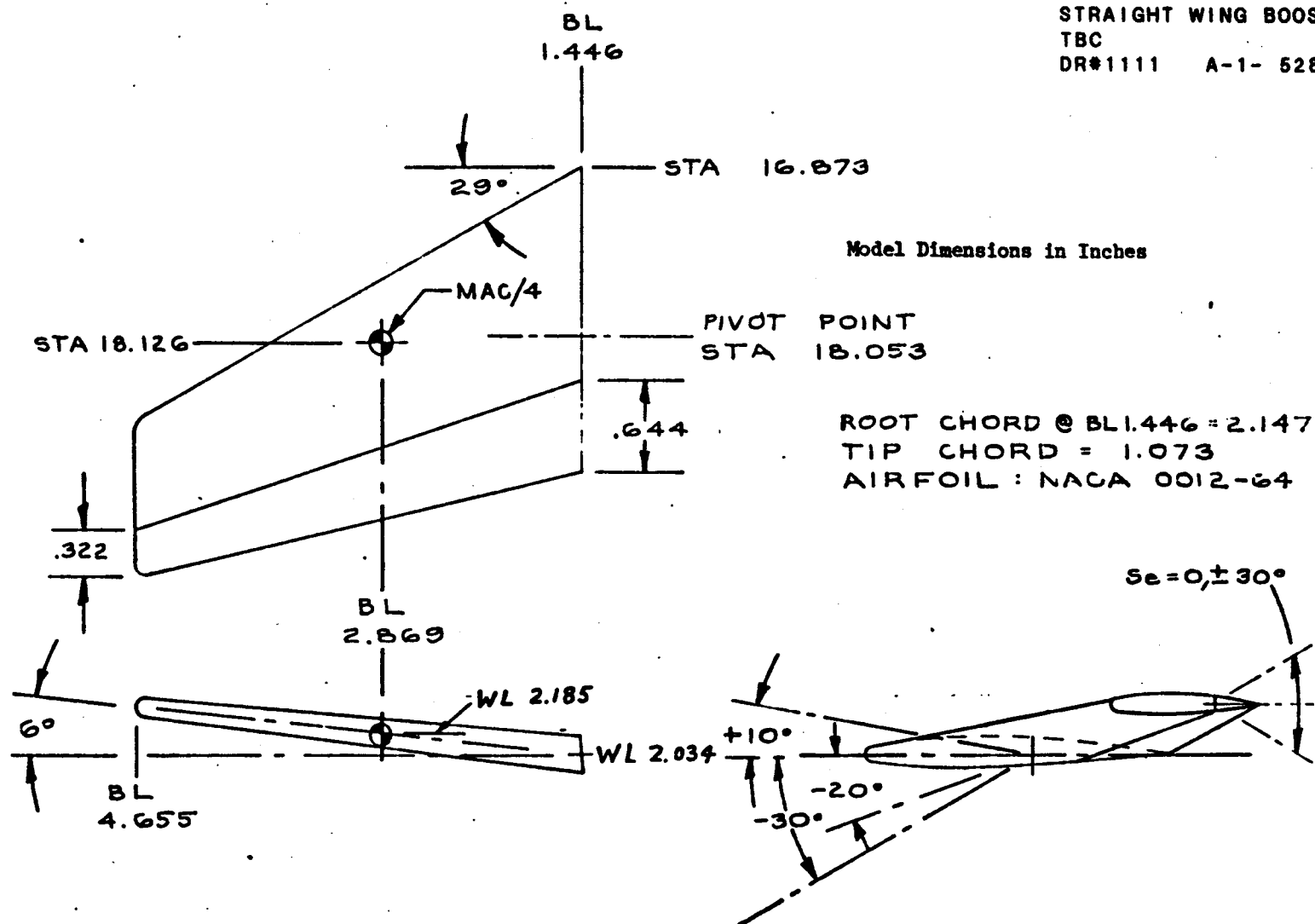


Figure I. Wing,  $W_1$

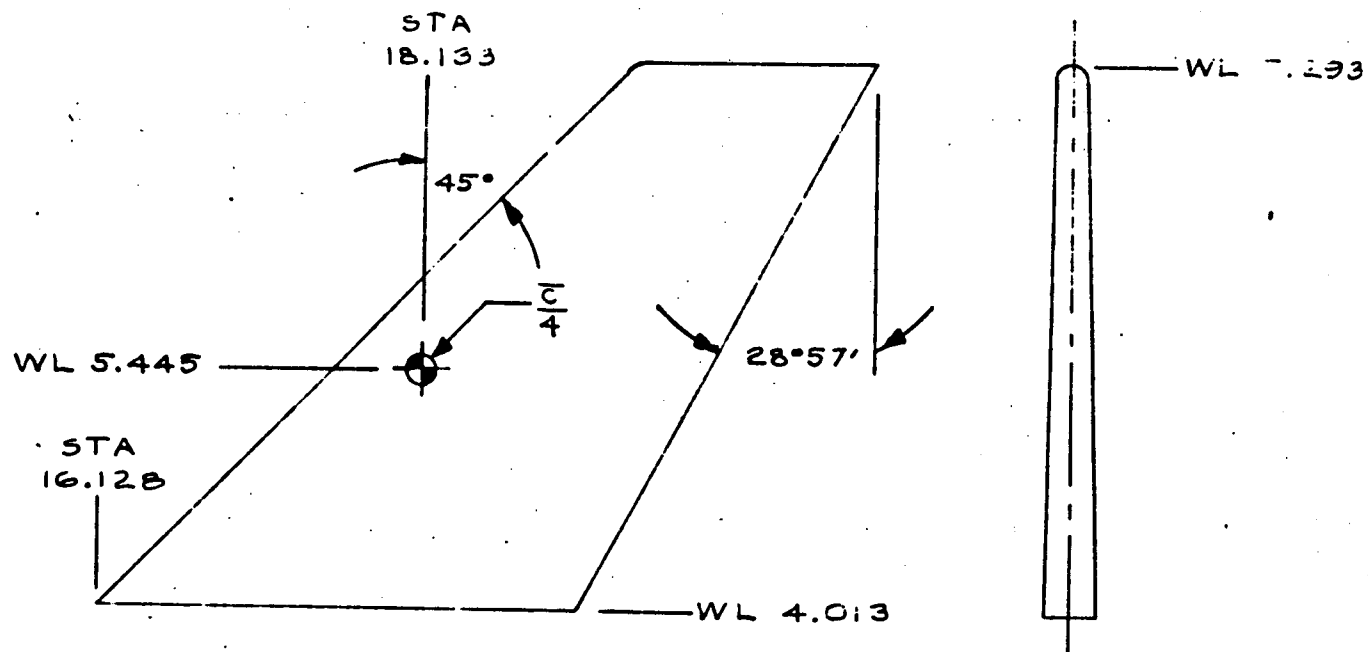
STRAIGHT WING BOOSTER  
 TBC  
 DR#1111 A-1- 527

STRAIGHT WING BOOSTER  
TBC  
DR#1111 A-1- 528



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Figure J. Horizontal Tail, H<sub>2</sub>



Model Dimensions in Inches

TIP CHORD = 1.467  
 ROOT CHORD = 2.933  
 AIRFOIL : NACA 0012-64

Figure K. Vertical Tail,  $V_3$

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STRAIGHT WING BOOSTER  
TBC  
DR#1158 A-1- 530

TEST GAC HST-020 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES		NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		$\alpha$	$\beta$	$S_1$	$S_2$		8.12									
RCX011	B6	A	0°	-	-		5									
021	B6W4			-	-		6									
031	B6W4H4			0°	0°		13									
041				0°	-15°		14									
061				-15°	-30°		9									
071				-15°	-15°		9									
081				-15°	0°		7									
091				-30°	0°		12									
101				-30°	-15°		11									
111				-30°	-30°		10									
131	B6W5H4			-15°	0°		15									
311	B6W5H5			-15°	-		17									
321	B5W5H4			-15°	0°		18									
301	B9W5H4			-15°	0°		16									
181	B7W5H4			-15°	0°		19									
013	B6	10°	C	-	-		22									
023	B6W4			-	-		21									
023	B6W4H4			-15°	0°		20									
143	B6W6H4			-15°	0°		23									
153	B6W7H4			-15°	0°		24									

1 7 13 19 25 31 37 43 49 55 61 67 7576  
CN ICAF ICY CLM FBL FLN CDF CL CAB IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:  $\alpha_A; +40^\circ$  to  $+85^\circ$   
 $\alpha$  or  $\beta$   $\alpha_B; -5^\circ$  to  $+30^\circ$   
SCHEDULES  $\beta_C; -10^\circ$  to  $+10^\circ$

NASA-MSFC-WAF

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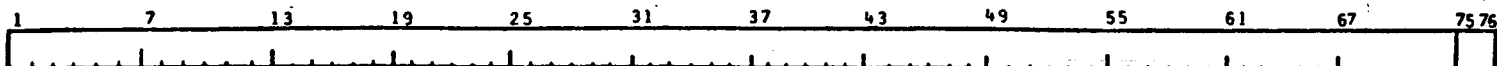
ORIGINAL PAGE IS  
OF POOR QUALITY

# TEST GAC HST 020 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)															
		$\alpha$	$\beta$	$\delta_s$	$\delta_c$				8.12															
<u>RCX192</u>	<u>B<sub>2</sub> V<sub>3</sub></u>	<u>B</u>	<u>0°</u>	<u>-</u>	<u>-</u>				<u>.37</u>															
<u>202</u>	<u>B<sub>2</sub> W<sub>4</sub> V<sub>3</sub></u>			<u>-</u>	<u>-</u>				<u>.30</u>															
<u>222</u>	<u>B<sub>2</sub> W<sub>4</sub> H<sub>4</sub> V<sub>3</sub></u>			<u>-15°</u>	<u>0°</u>				<u>.32</u>															
<u>232</u>	<u>B<sub>2</sub> W<sub>4</sub> H<sub>4</sub> V<sub>3</sub></u>			<u>0°</u>	<u>0°</u>				<u>.29</u>															
<u>272</u>	<u>B<sub>2</sub> H<sub>4</sub> V<sub>3</sub></u>			<u>-15°</u>	<u>0°</u>				<u>.36</u>															
<u>332</u>	<u>B<sub>2</sub> W<sub>4</sub> H<sub>4</sub> V<sub>3</sub></u>			<u>-15°</u>	<u>-15°</u>				<u>.31</u>															
<u>342</u>	<u>B<sub>2</sub> W<sub>5</sub> H<sub>4</sub> V<sub>3</sub></u>			<u>-15°</u>	<u>0°</u>				<u>.34</u>															
<u>352</u>	<u>B<sub>12</sub> W<sub>4</sub> H<sub>4</sub> V<sub>3</sub></u>			<u>-15°</u>	<u>0°</u>				<u>.33</u>															
<u>362</u>	<u>B<sub>11</sub> W<sub>4</sub> H<sub>4</sub> V<sub>3</sub></u>	<u>↓</u>	<u>↓</u>	<u>-15°</u>	<u>0°</u>				<u>.35</u>															
<u>284</u>	<u>B<sub>2</sub></u>	<u>0°</u>	<u>C</u>	<u>-</u>	<u>-</u>				<u>.38</u>															
<u>294</u>	<u>B<sub>2</sub> W<sub>4</sub></u>			<u>-</u>	<u>-</u>				<u>.39</u>															
<u>204</u>	<u>B<sub>2</sub> W<sub>4</sub> V<sub>3</sub></u>			<u>-</u>	<u>-</u>				<u>.40</u>															
<u>224</u>	<u>B<sub>2</sub> W<sub>4</sub> H<sub>4</sub> V<sub>3</sub></u>			<u>-15°</u>	<u>0°</u>				<u>.41</u>															
<u>374</u>	<u>B<sub>2</sub> W<sub>6</sub> H<sub>4</sub> V<sub>3</sub></u>			<u>-15°</u>	<u>0°</u>				<u>.42</u>															
<u>384</u>	<u>B<sub>2</sub> W<sub>7</sub> H<sub>4</sub> V<sub>3</sub></u>	<u>↓</u>	<u>↓</u>	<u>-15°</u>	<u>0°</u>				<u>.43</u>															



COEFFICIENTS:

$\alpha$  or  $\beta$

SCHEDULES

$\alpha$ ; +40° to +85°

$\alpha$ ; -5° to +30°

$\beta$ ; -10° to +10°

IDPVAR(1) IDPVAR(2) NDV

STRAIGHT WING BOOSTER

TBC

DR#1158 A-1- 531

AX-1205I-1

MODEL ASSEMBLY  
DRAWING 1205-25

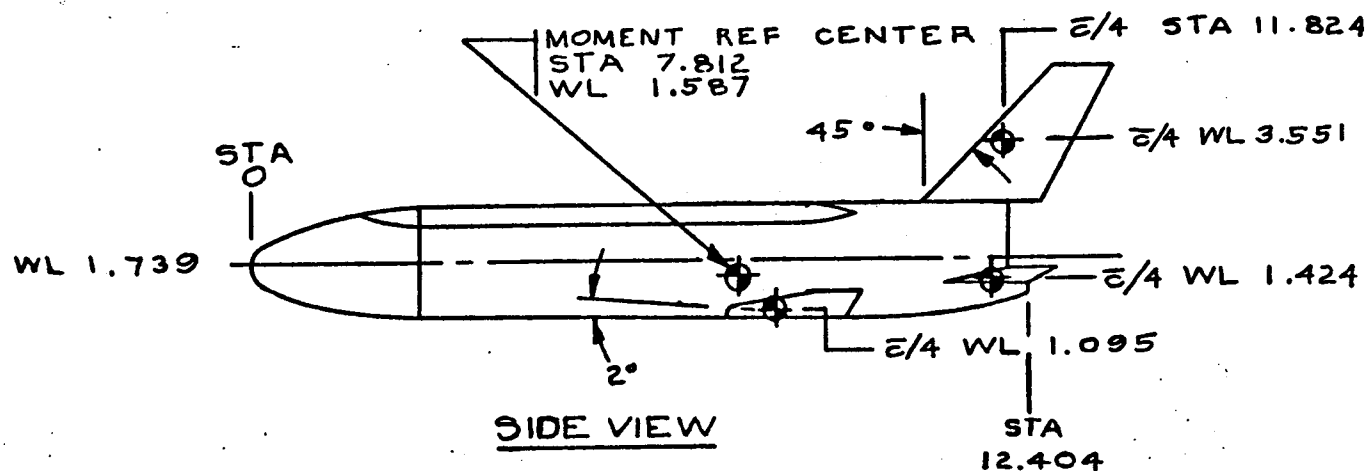
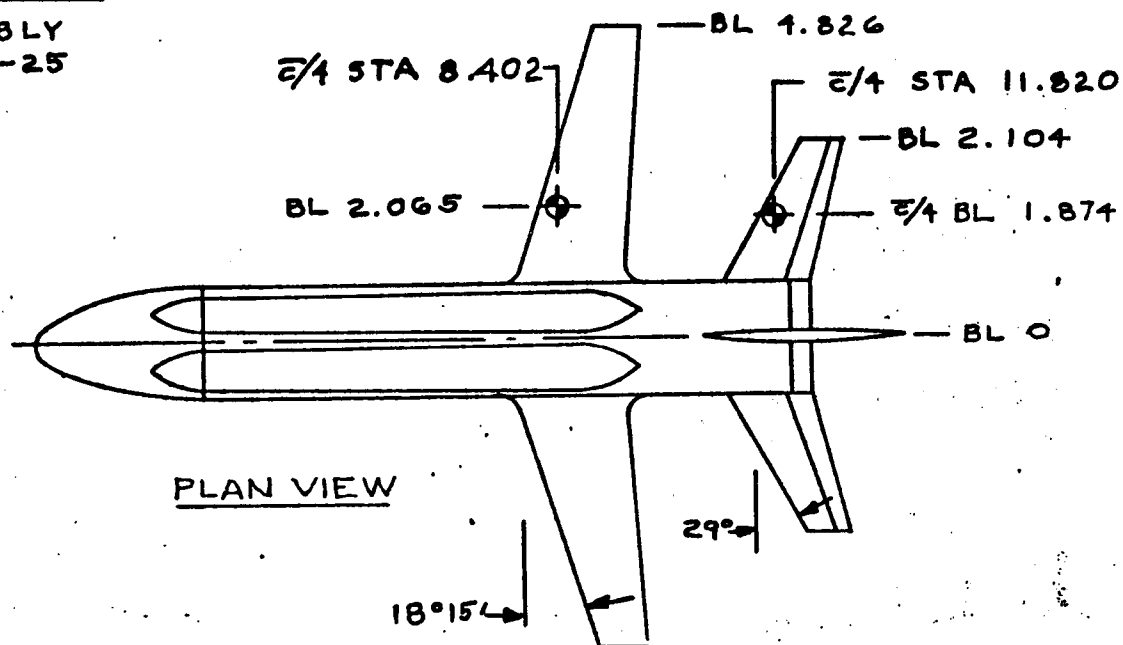
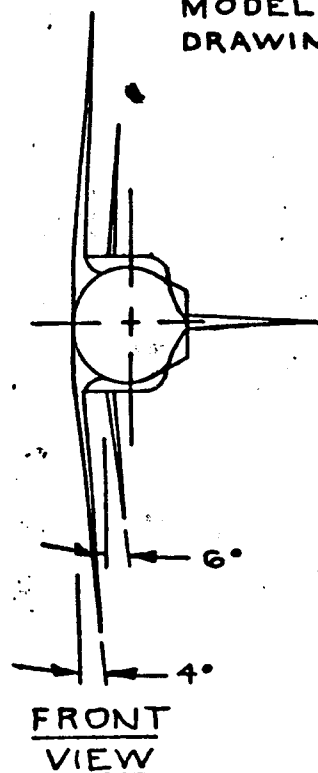


FIGURE 1. Model Assembly, BOOSTER H-32

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AX 1205I-1  
BODIES:

REF: 1205-7 NOCE  
1205-3 EDDY

STRAIGHT WING BOOSTER  
TBC  
DR#1158 A-1- 533

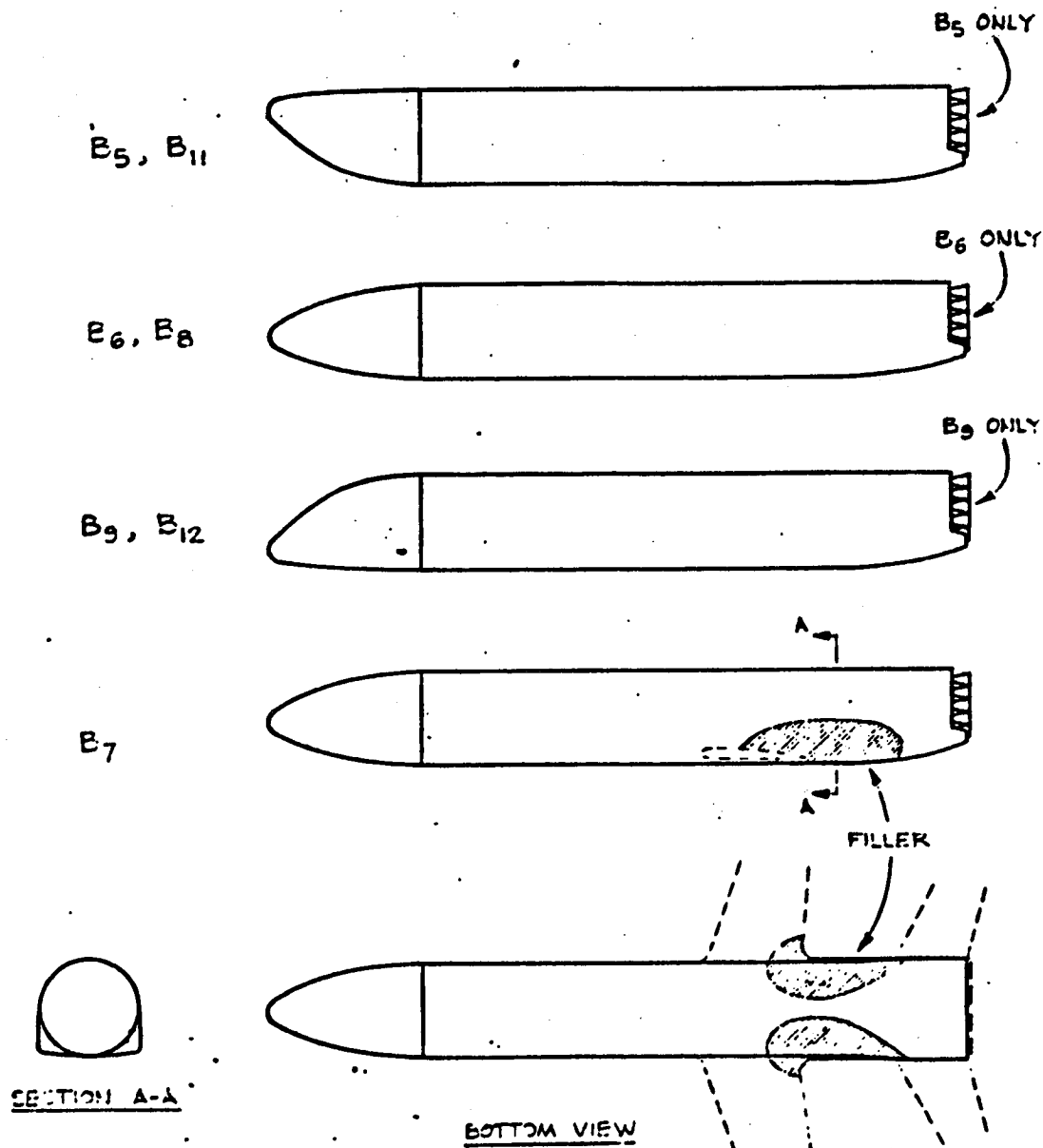


FIGURE 3. Model Body Configurations

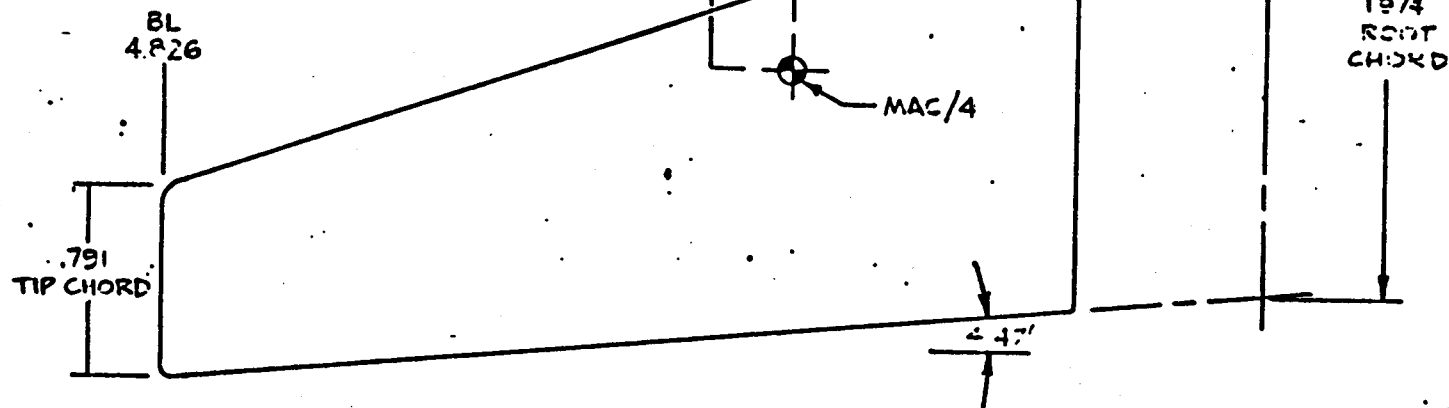


AX 1205I-1

WINGS

REF: 1205-6

$W_4, W_6, W_7$  - MS 2402  
 $W_5$  - MS S.6E2



AIRFOIL: NACA 0015-64  
 MAC = 1.469 IN.  
 INCIDENCE ANGLE = 2°  
 (WRT BODY  $\pm$ )

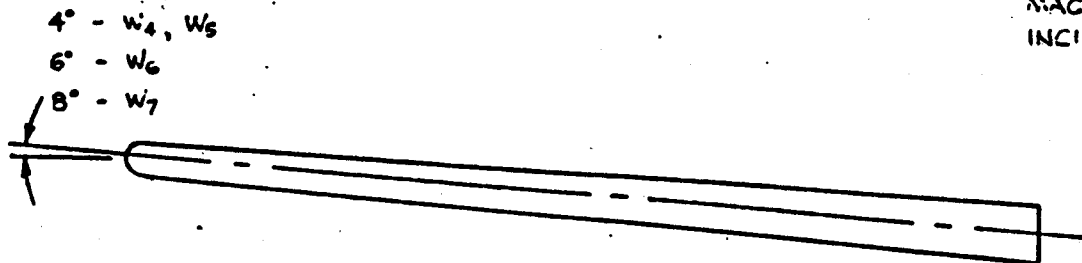


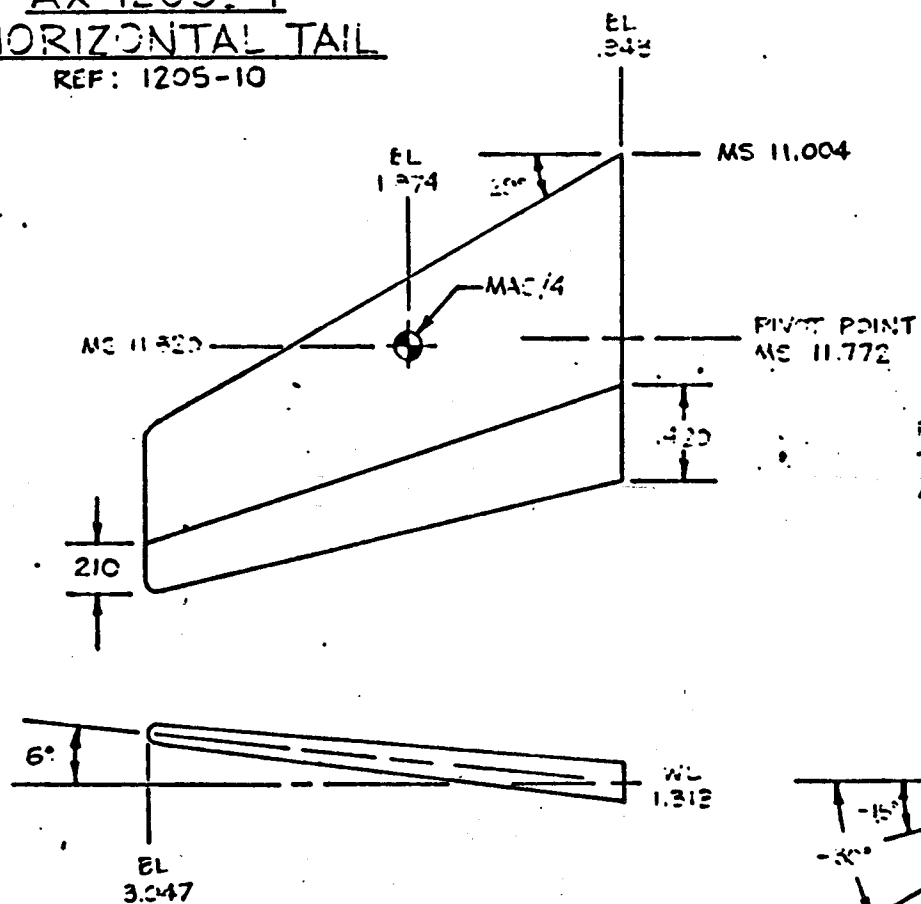
FIGURE 4. BOOSTER WING

STRAIGHT WING BOOSTER  
 TBC  
 DR#1158 A-1- 534

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AX 1205I-1  
HORIZONTAL TAIL

REF: 1205-10



ROOT CHORD @ EL 3.43 = 1.400 IN  
TIP CHORD = 0.700 IN.  
AIRFOIL: NACA 0012-64

$\delta e = 0^\circ - 5^\circ - 55^\circ$

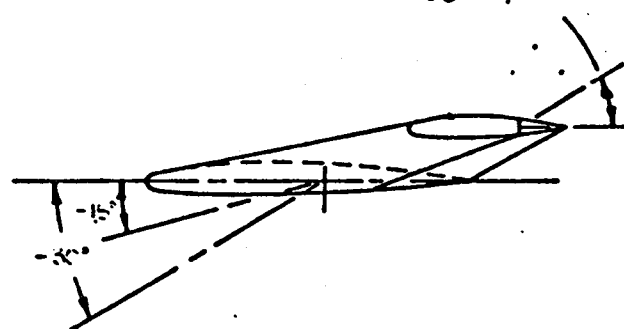
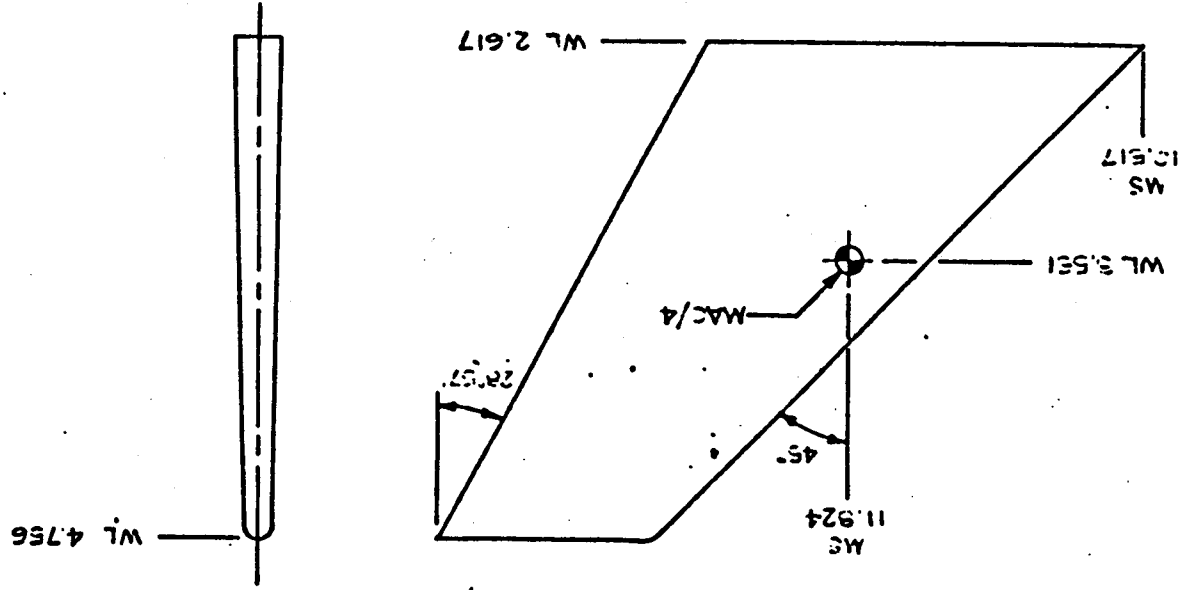


FIGURE 5. BOOSTER HORIZONTAL TAIL

STRAIGHT WING BOOSTER  
TBC  
DR#1158 A-1-536

AX 12051-1  
VERTICAL TAIL  
REF: 12051-1

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ROOT - RWD = 1.913 IN.  
TIP CHORD = 0.957 IN.  
AIRFOIL: NACA 0012-64

Figure 1 Boosted Vertical Tail

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TEST BTWT - 1265 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES		NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)	
		a	b	ds	de		3	4
RD2051	B8W4H4V3	A	0	-20	0	12	172	170
011	B8			-	-	8	210	212
041	B8W4H4V3			-20	-30	13	99	110
061				0	-30	8	112	114
071				0	0	13	189	200
031	B8W4V3					8	202	204
057	B8W4H4V3	30	B	-20	0	3	51	52
059	B8W4H4V3	74				7	167	168
169	B8W4H4	74				3		186
044	B8W4H4V3	D	0	-30		3	79	78
064				0	-30	3	76	75
074				0	0	15	103	109
073		E		0	0	5	54	57
034	B8W4V3	D		-	-	15	95	99
134	B14W4H4V3	D		0	0	4	8	7
108	B8W4H4V3S2	25	B			1		6
103		E	0			5	73	72
102				+4		5	67	66
072	B8W4H4V3			+4		5	62	61
RD2075	B8W4H4V3					6	17	

CN	CL	CLM	CDF	CBL	CYN	CY
1	7	13	19	25	31	37
2	43	49	55	61	67	75

COEFFICIENTS:  
a or b  
SCHEDULES

KA : 56,58,60,62,64,66,68,70,72,74,76,78,80,82,84,86  
KB : -4,-2,0,2,4,6,8,10,12  
KD : 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30  
KE : 85,10,12,14,16,18,20,22,24,26,28,30,32,34,36

STRAIGHT WING BOOSTER  
TBC  
DR#1191 A-1-537

## STRAIGHT WING BOOSTER

**TBC**

DR#

DR#1191 A-1- 538

**PRETEST**

## POSTTEST

[illegible]

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**COEFFICIENTS:**

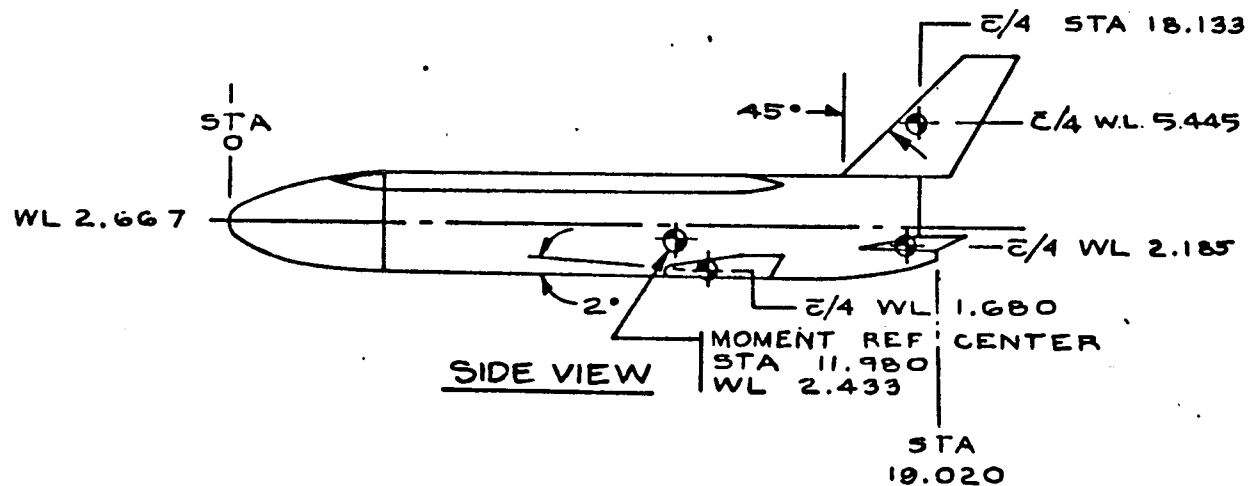
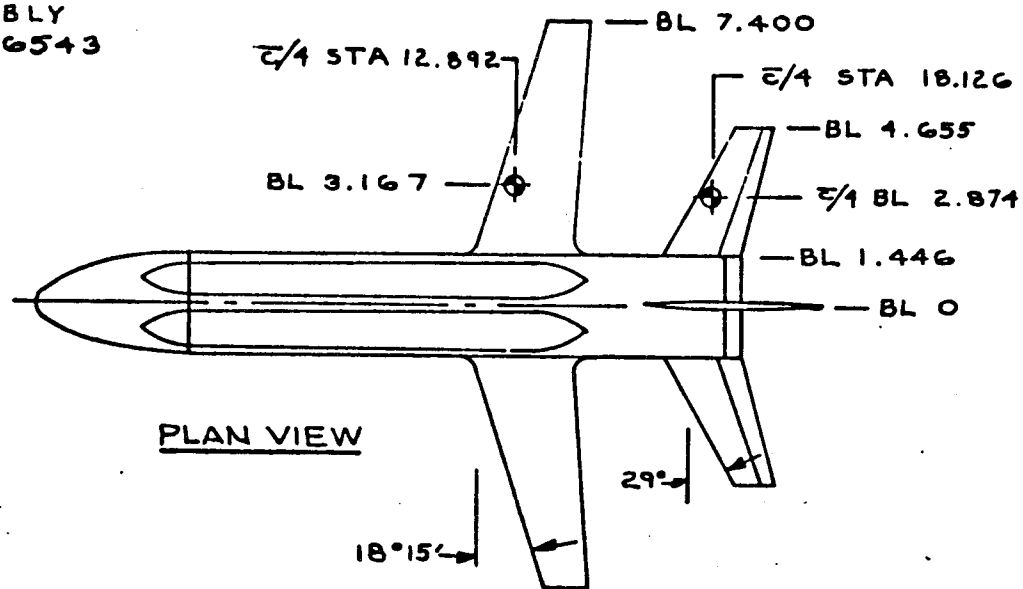
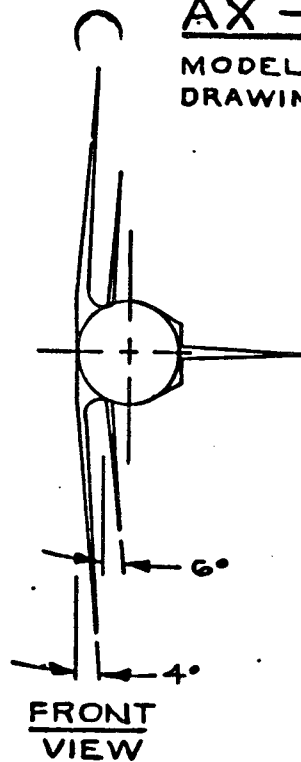
**a or b  
SCHEDULES**

→ IDPVAR(1) IDPVAR(2) NDV

**NASA-MSFC-MAF**

**AX-1202I-2**

MODEL ASSEMBLY  
DRAWING 25-56543

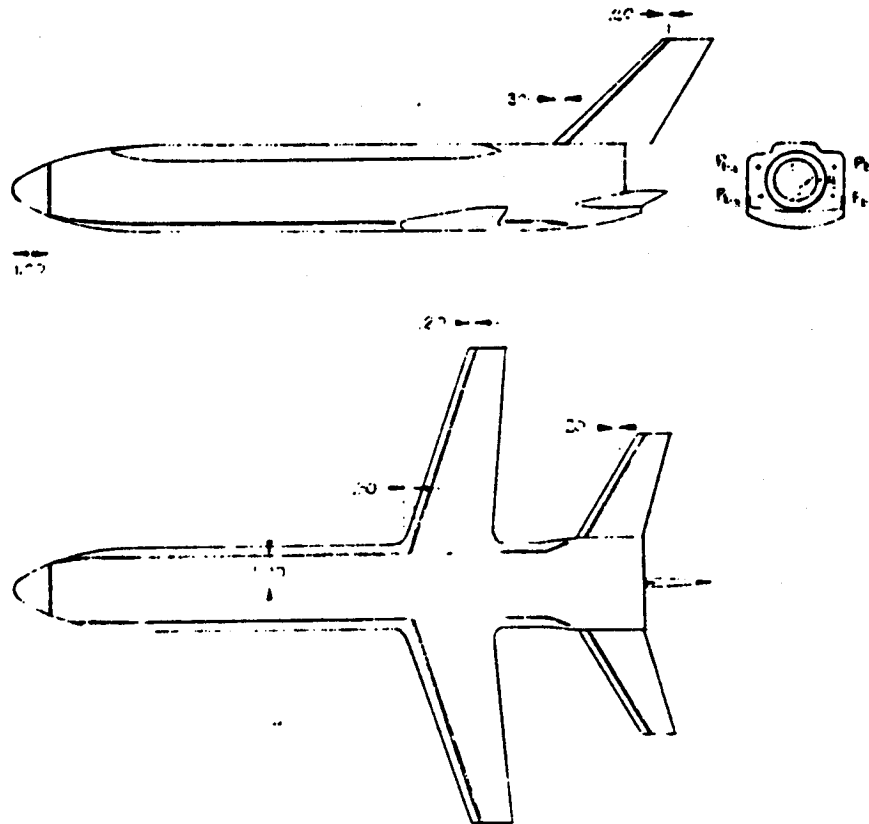


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Figure 2.

STRAIGHT WING BOOSTER  
TBC  
DR#1191 A-1- 539

AX 1202 I-2  
TRIP STRIPS



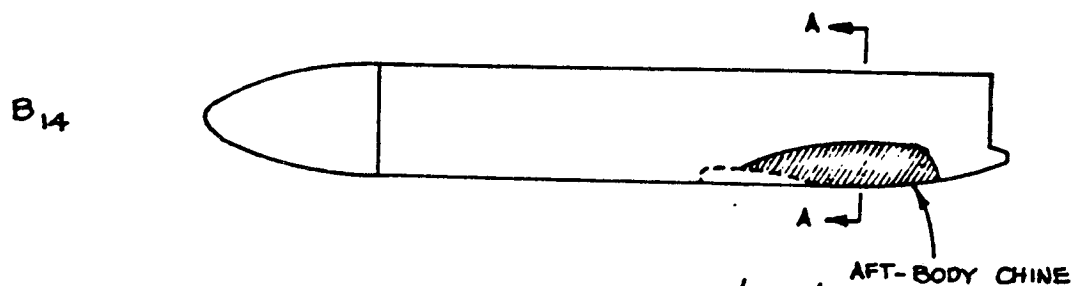
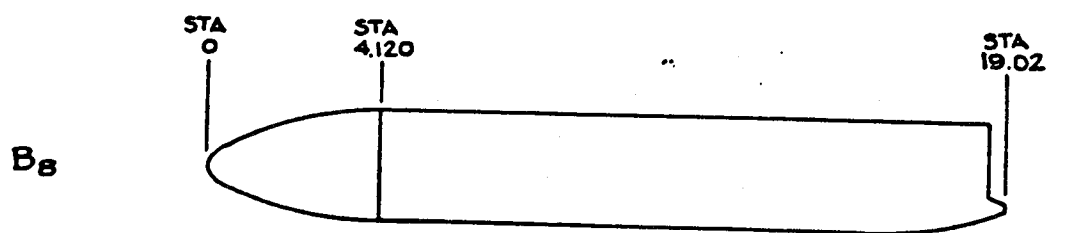
FUSELAGE: # 100 GRIT, .10" WIDE, 120-150/IN.  
WING, TAILS: # 120 GRIT, .10" WIDE, 120-150/IN.

Figure 4.

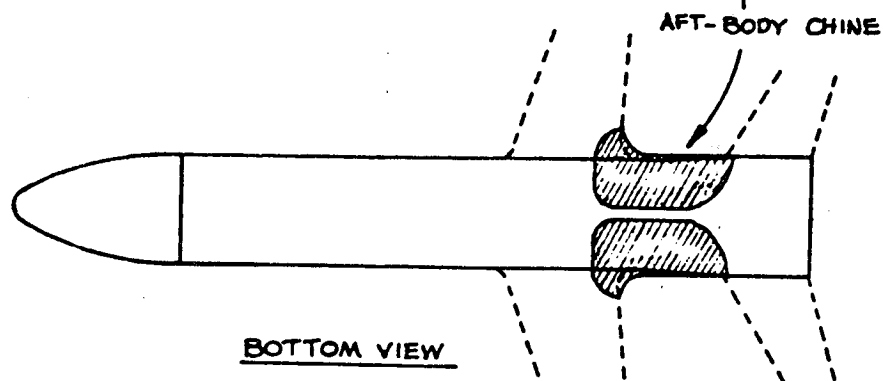
AX 1202 I-2  
BODIES

REF: 1202-6 BODY  
1202-12 NOSE

STRAIGHT WING BOOSTER  
TBC  
DR#1191 A-1- 541



SECTION A-A



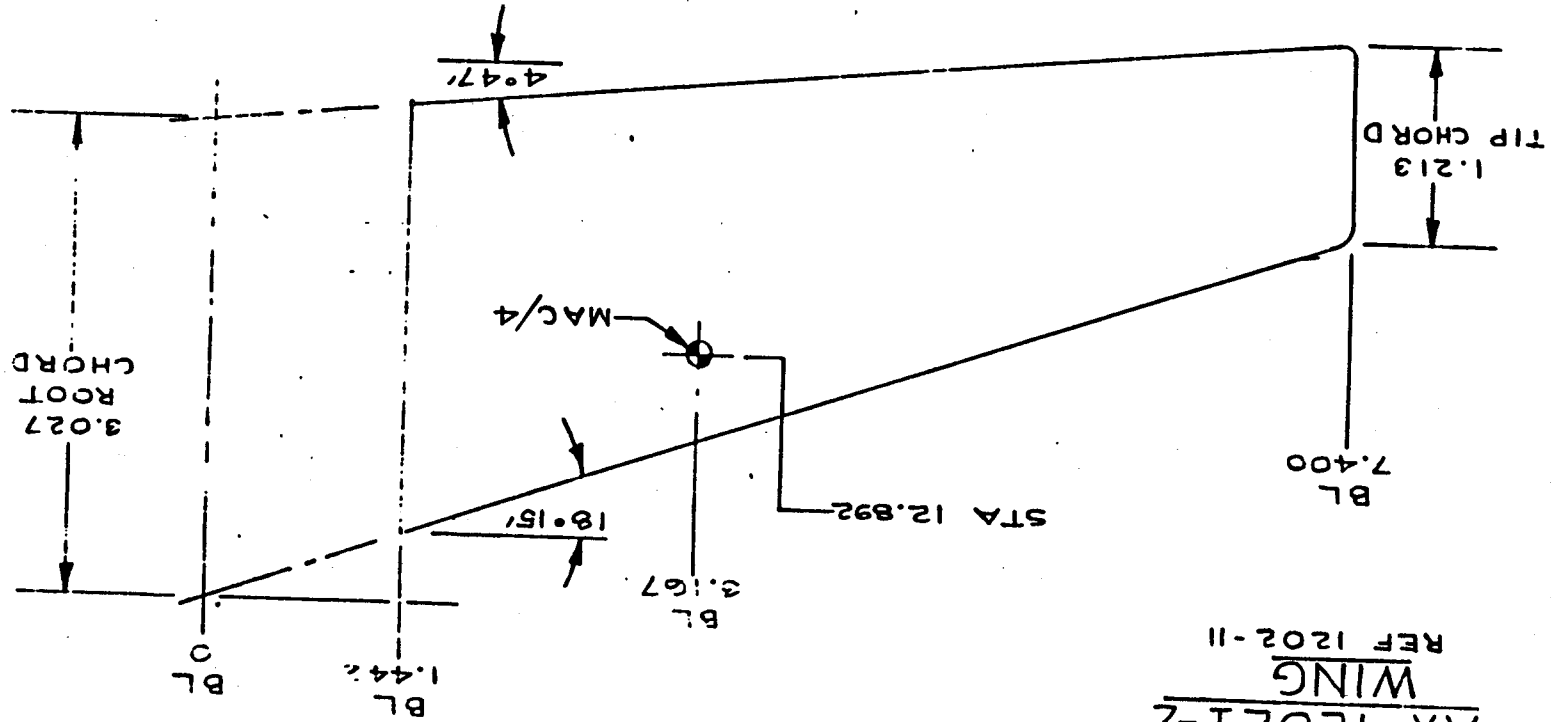
BOTTOM VIEW

Figure 5.



STRAIGHT WING BOOSTER  
TBC  
DR#1191 A-1-542

AX-1202I-2  
WING  
REF 1202-II



AIRFOIL NACA 0015-64  
MAC = 2.240  
INCIDENCE ANGLE 2°  
WITH RESPECT TO BODY

Figure 6.

AX-1202I-2  
SPOILER  
 REF 1202-18

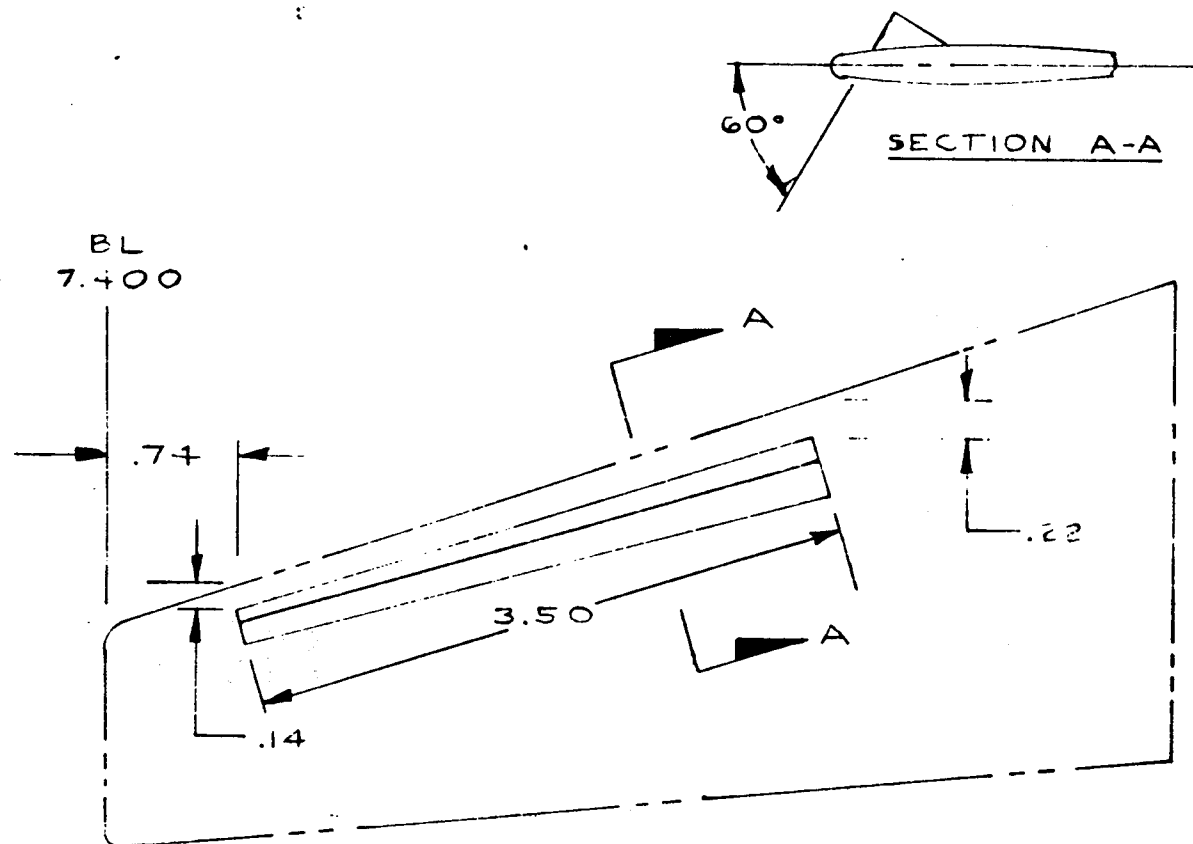


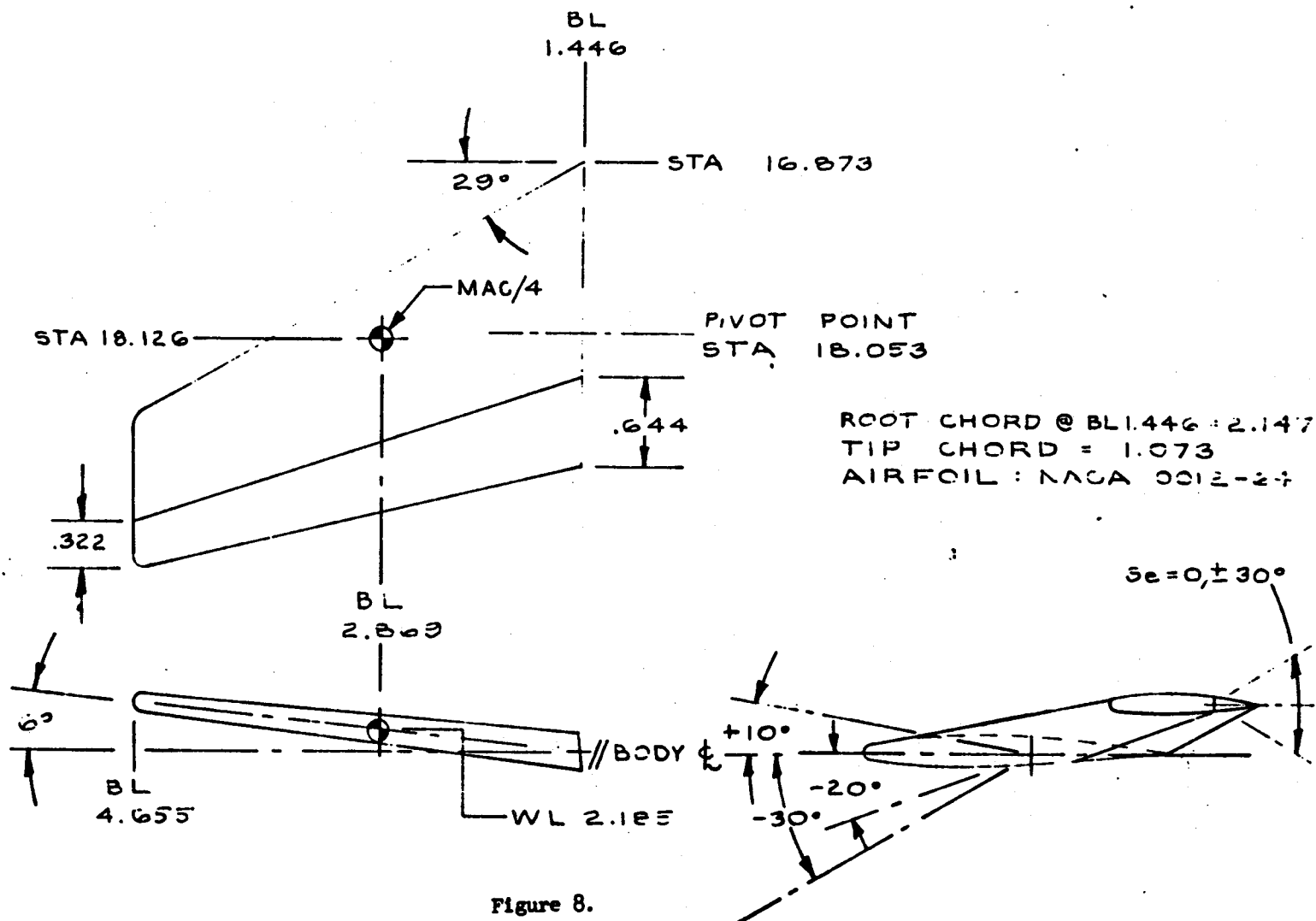
Figure 7.

STRAIGHT WING BOOSTER  
 TBC  
 DR#1191 A-1- 543

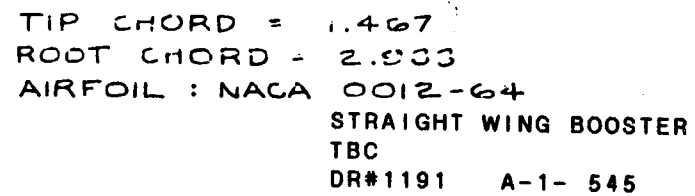
AX-1202I-2  
HORIZONTAL TAIL  
REF 1202-5

STRAIGHT WING BOOSTER  
TBC  
DR#1191 A-1- 544

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**ORIGINAL PAGE IS  
OF POOR QUALITY**



638

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1046 A-1- 546

**□ PRETEST**

☒ POSTTEST

ORIGINAL PAGE IS  
OF POOR QUALITY

**COEFFICIENTS:**

$A(4^\circ \text{ to } 18^\circ)$      $D(28^\circ \text{ to } 50^\circ)$   
 $B(4^\circ \text{ to } 34^\circ)$      $E(22^\circ \text{ to } 36^\circ)$   
 $C(12^\circ \text{ to } 15^\circ)$

→ IDPVAR(1) | IDPVAR(2) | NDV

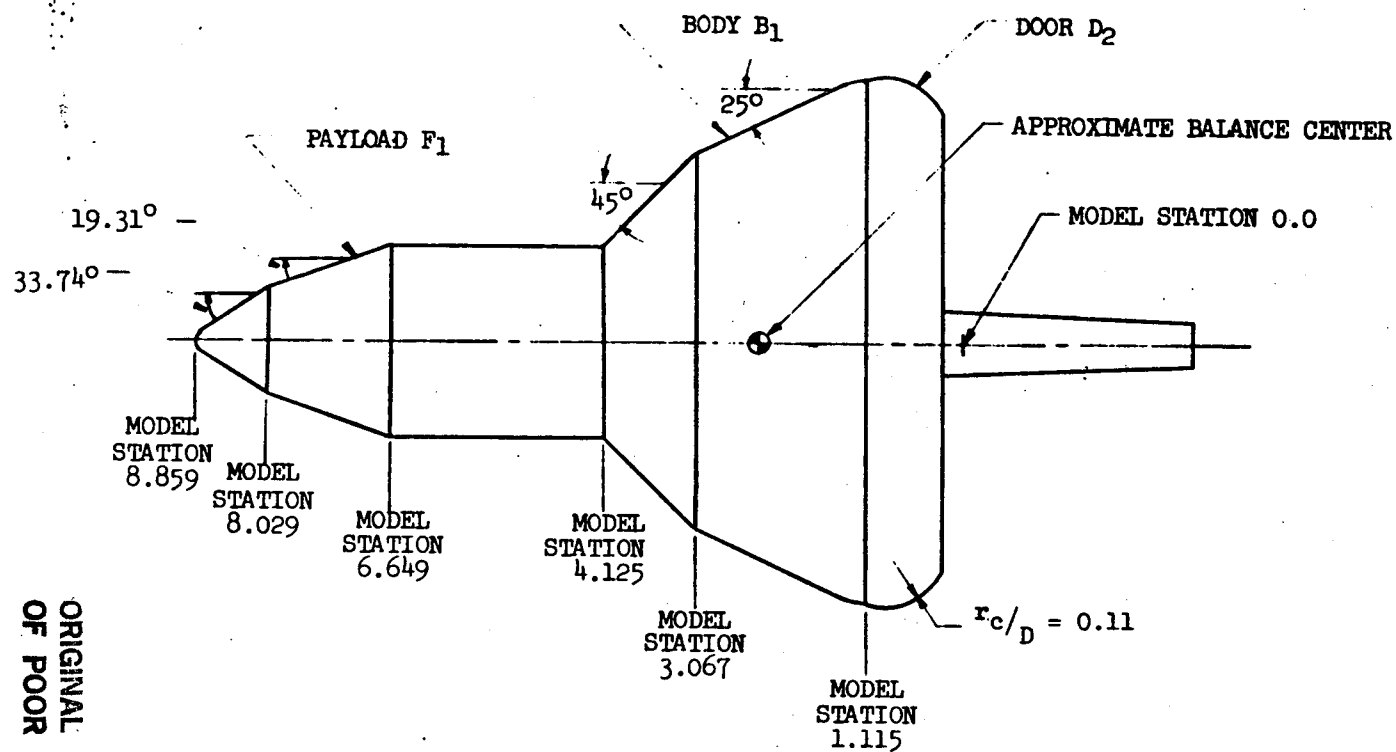


FIGURE 4. MODEL CONFIGURATION - F<sub>1</sub>B<sub>1</sub>D<sub>2</sub>

UNIQUE CONFIGS. BOOSTER

CCSD

DR#1046 A-1- 547

028 MAR. 66

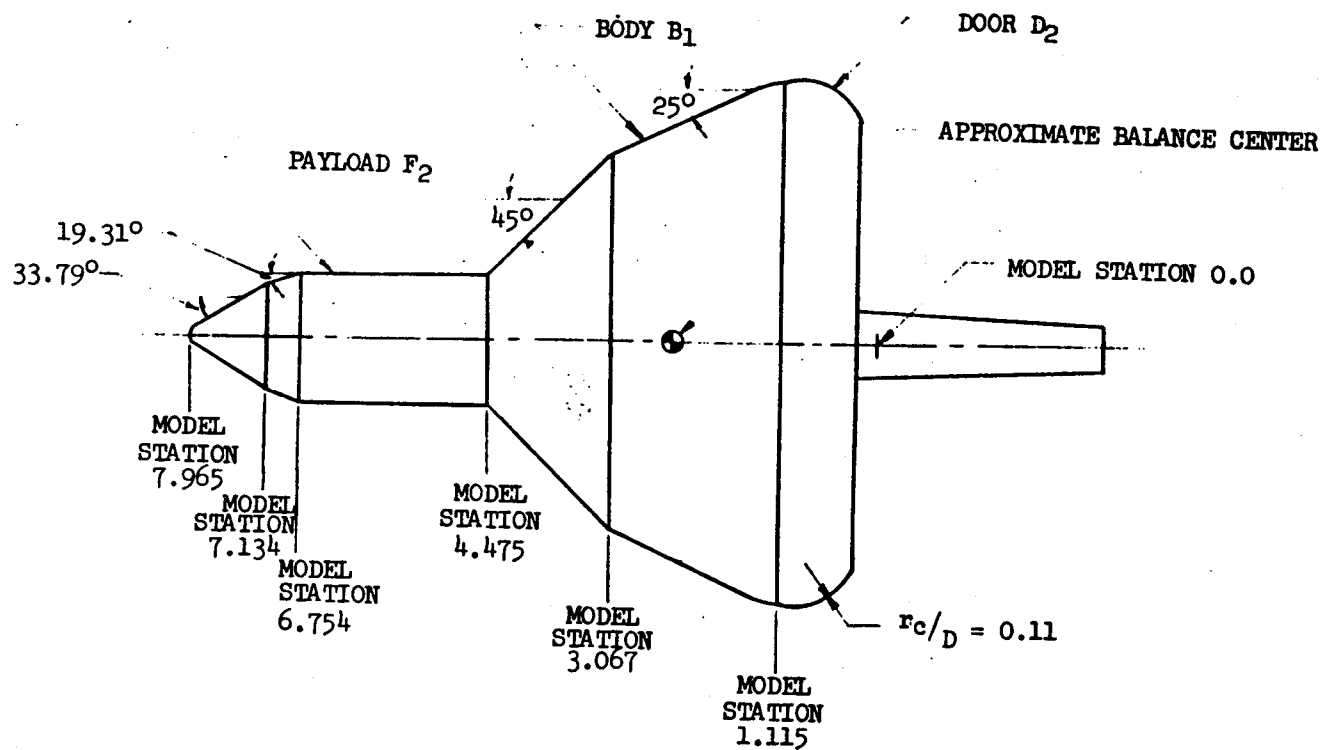


FIGURE 5. MODEL CONFIGURATION -  $F_2B_1D_2$

028 MAR. 66

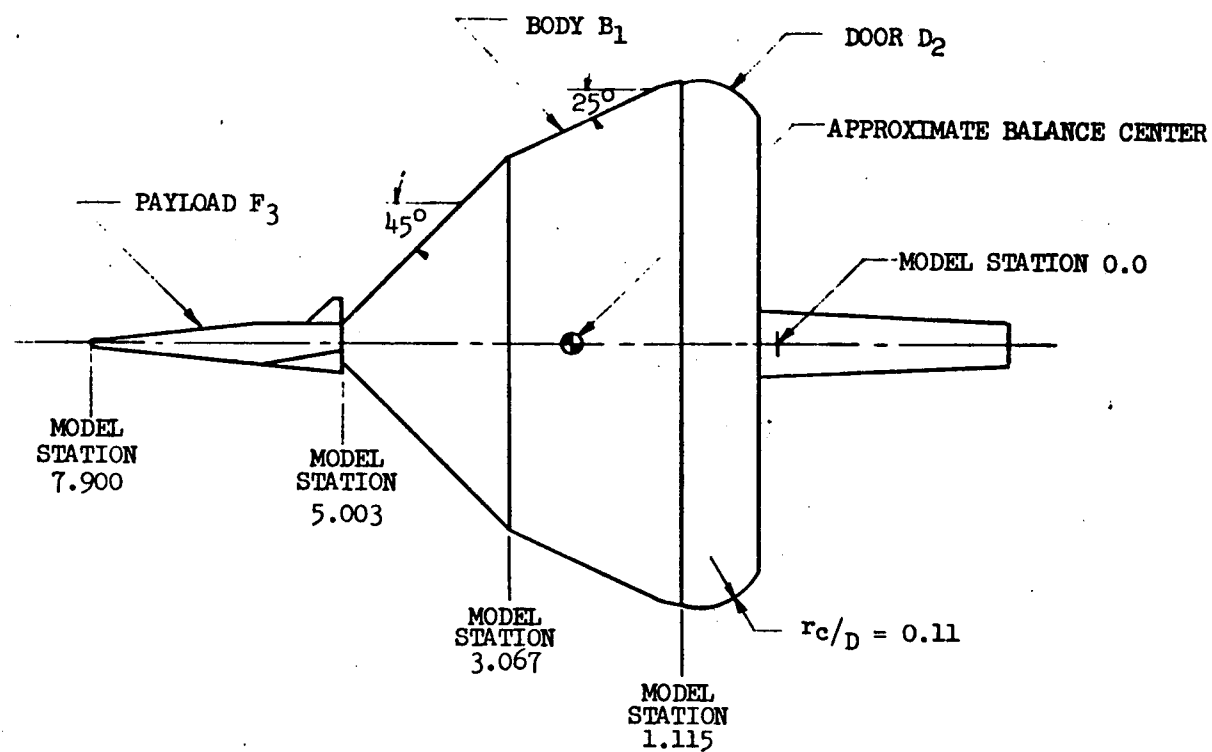


FIGURE 6. MODEL CONFIGURATION -  $F_3B_1D_2$

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1046 A-1- 549



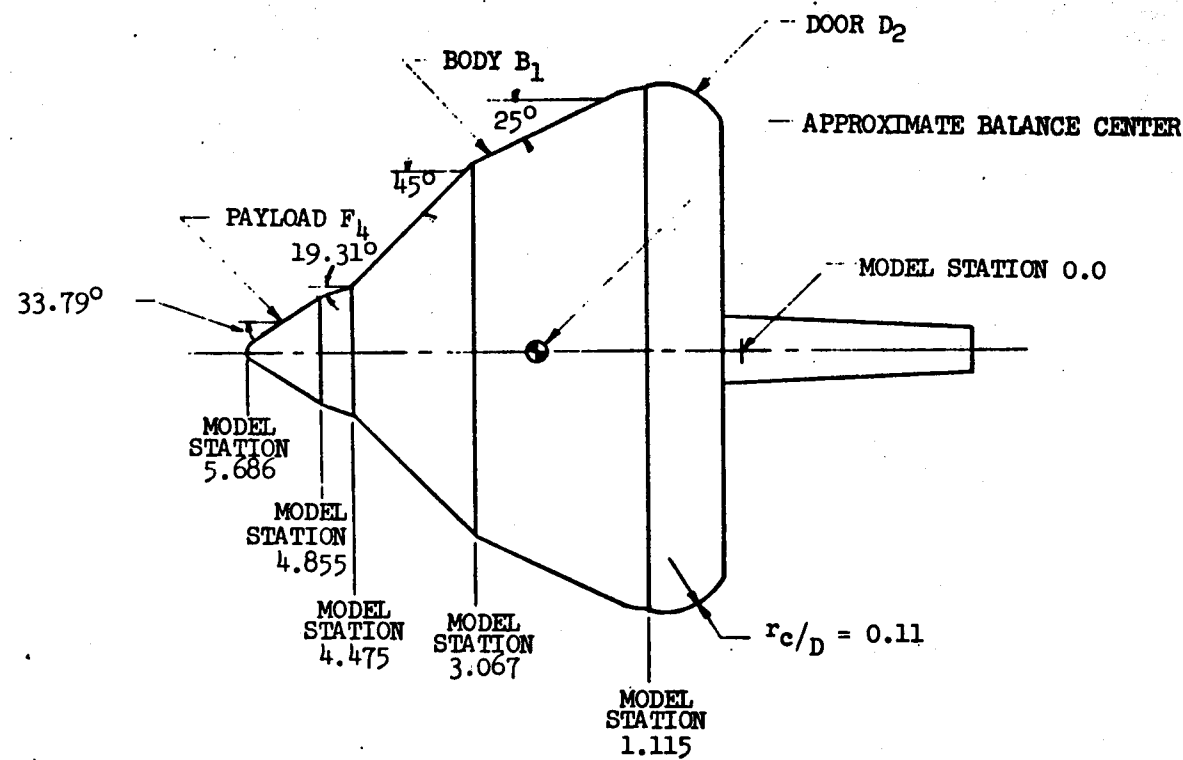


FIGURE 7. MODEL CONFIGURATION -  $F_4B_1D_2$

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NASA-MSFC-MAF

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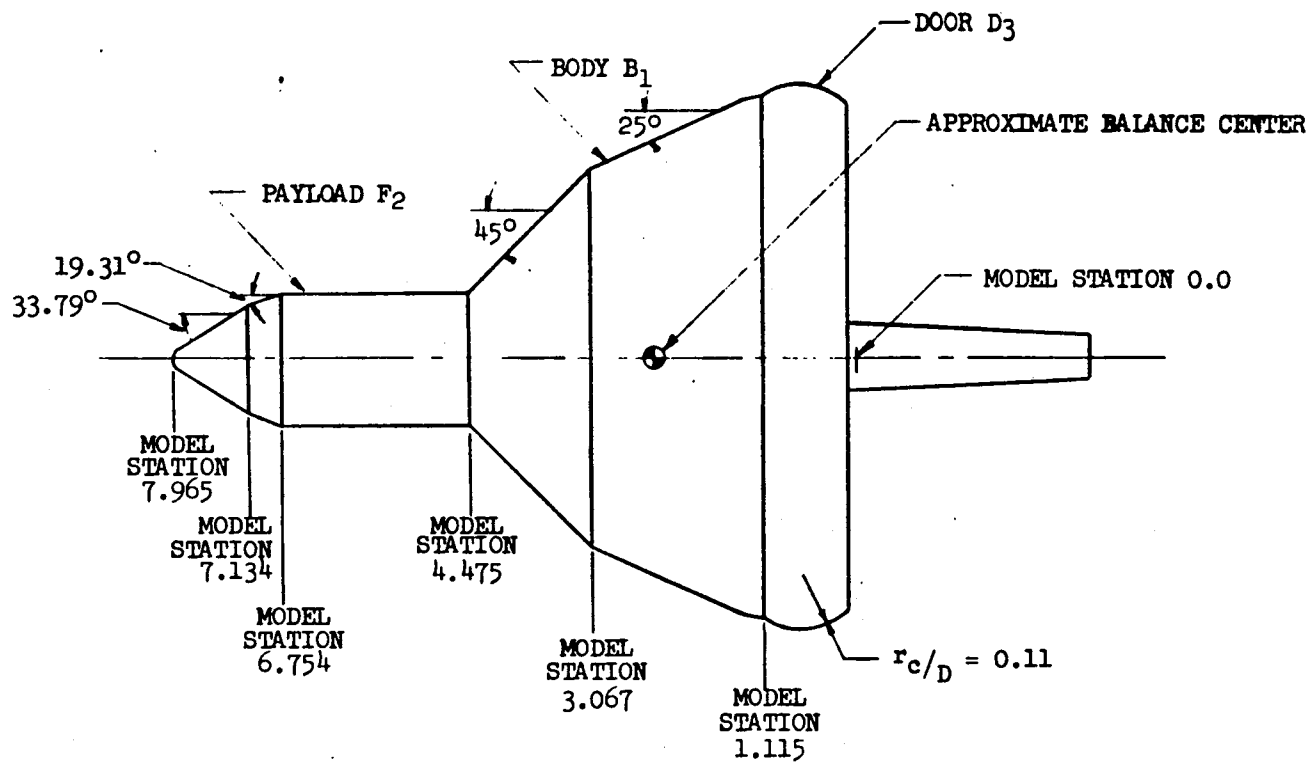


FIGURE 8. MODEL CONFIGURATION - F2B1D3

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1046 A-1- 551

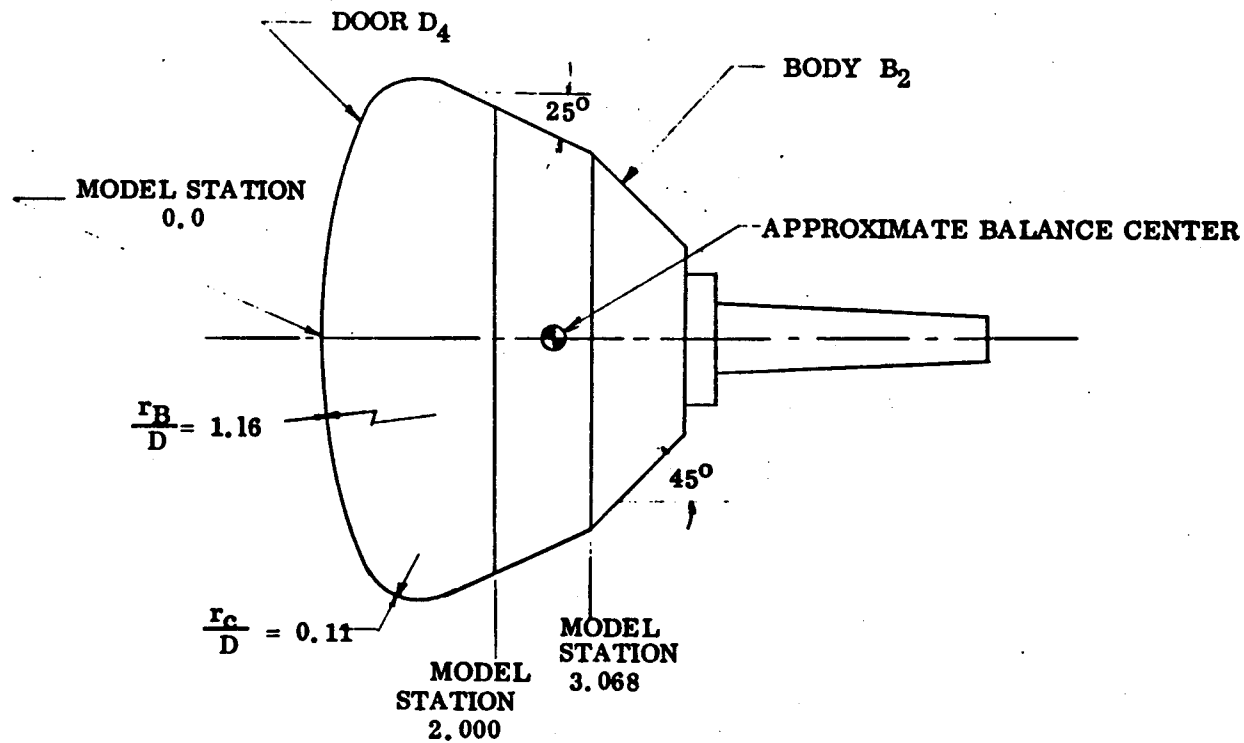


FIGURE 9. MODEL CONFIGURATION - OB<sub>2</sub>D<sub>4</sub>

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OF POOR QUALITY

REPRODUCED FROM  
NASA-MSFC-MAF

NASA-MSFC-MAF

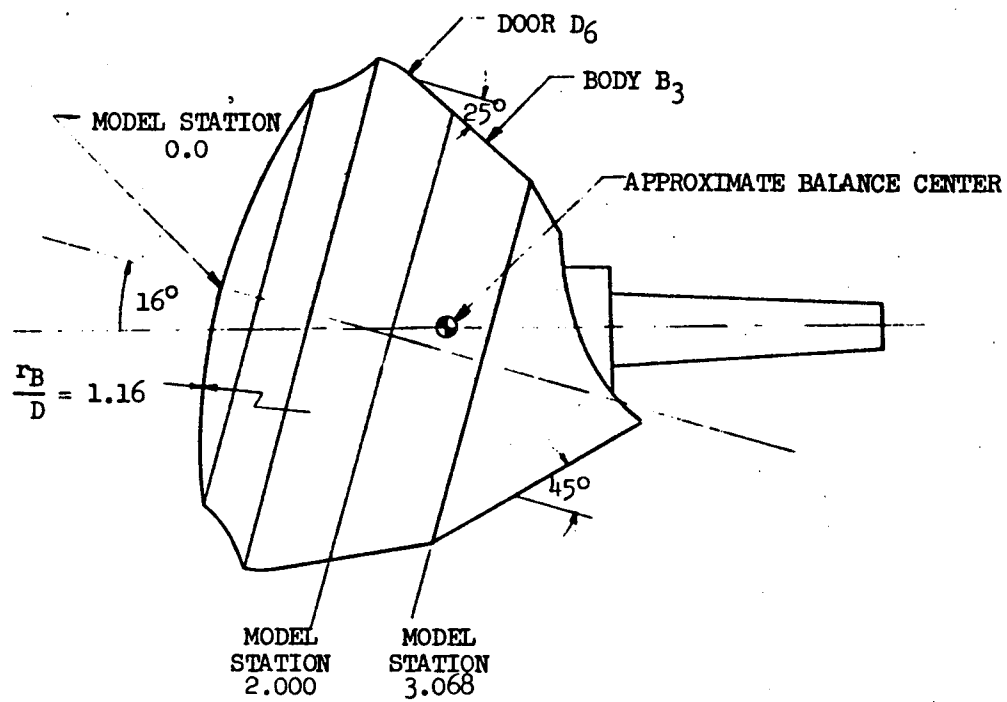


FIGURE 10. MODEL CONFIGURATION - OB<sub>3</sub>D<sub>6</sub>

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1046 A-1- 553

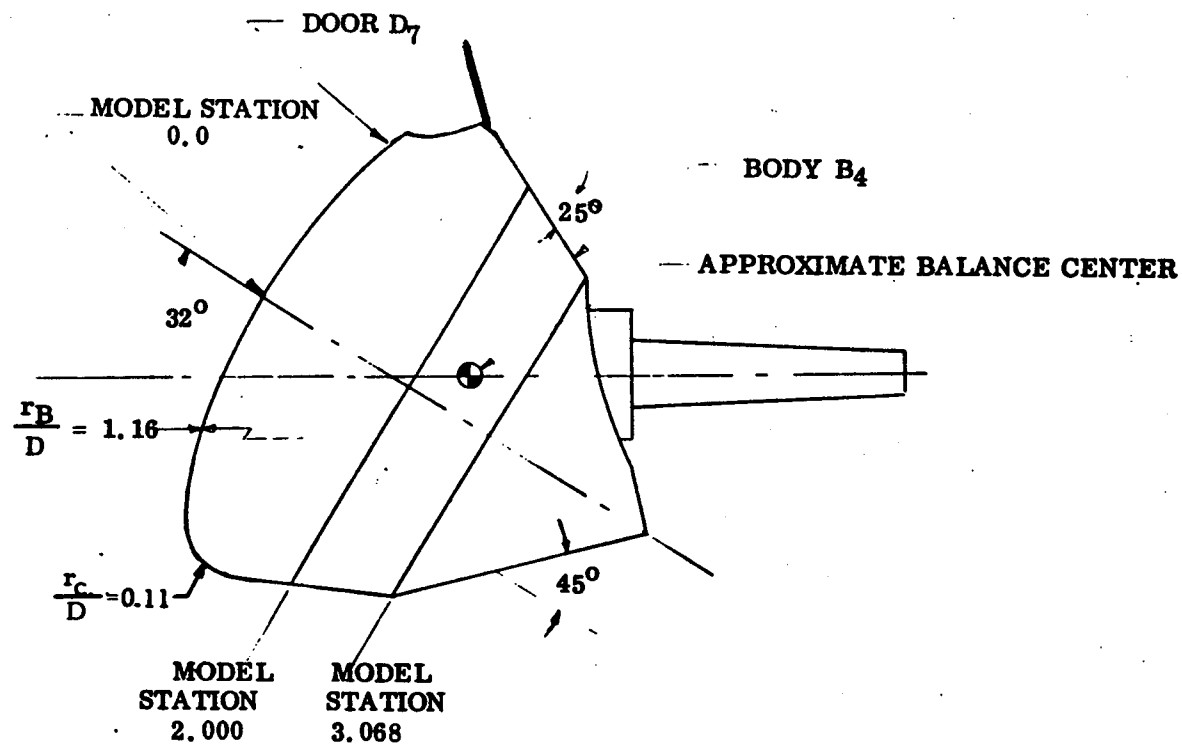


FIGURE 11. MODEL CONFIGURATION - OB<sub>4</sub> D<sub>7</sub>

TEST 11-12 9143 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B	R/D	BETA	EDDY		3.6	3.85	4.64							
RRL001	F1B1D2	A	0	.11	0	25°	3	3	1	2							
2	F2B1D2	T	T	T	T		T	4	5	6							
3	F3B1D2	T	T	T	T		T	9	7	6							
4	F4B1D2	T	T	T	T	25°	3	10	11	12							
5	F2B1D3	A				45°	2	15	13								
6	F2B1D3	D		T		45°	1			14							
7	OB3D4	B		.11	0		3	16	17	18							
8	OB3D5	T		.05	0		T	19	20	21							
9	OB3D6	T				OFF	T	24	22	23							
10	OB3D8	B		.08	0		T	25	26	27							
RRL 11	OB5D4	C	0	.11	0	0	3	28	29	30							

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
 CN CA CLM CL CD L/D CDE CAB MACH ALPHA 8  
 COEFFICIENTS: AC-4-2-1, 0, 1, 2, 4, 6, 8, 10, 12, 14, 16, 0) IDPVAR(1) IDPVAR(2) NDV  
 a or B  
 SCHEDULES B(6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 16)  
 C(-4-2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 26, 30, 35, 0)  
 D(-4-2, 0, 1, 2, 4, 6, 8, 10, 12, 14, 16, 0)

UNIQUE CONFIGS. BOOSTER  
 CCSD  
 DR#1068 A-1- 555

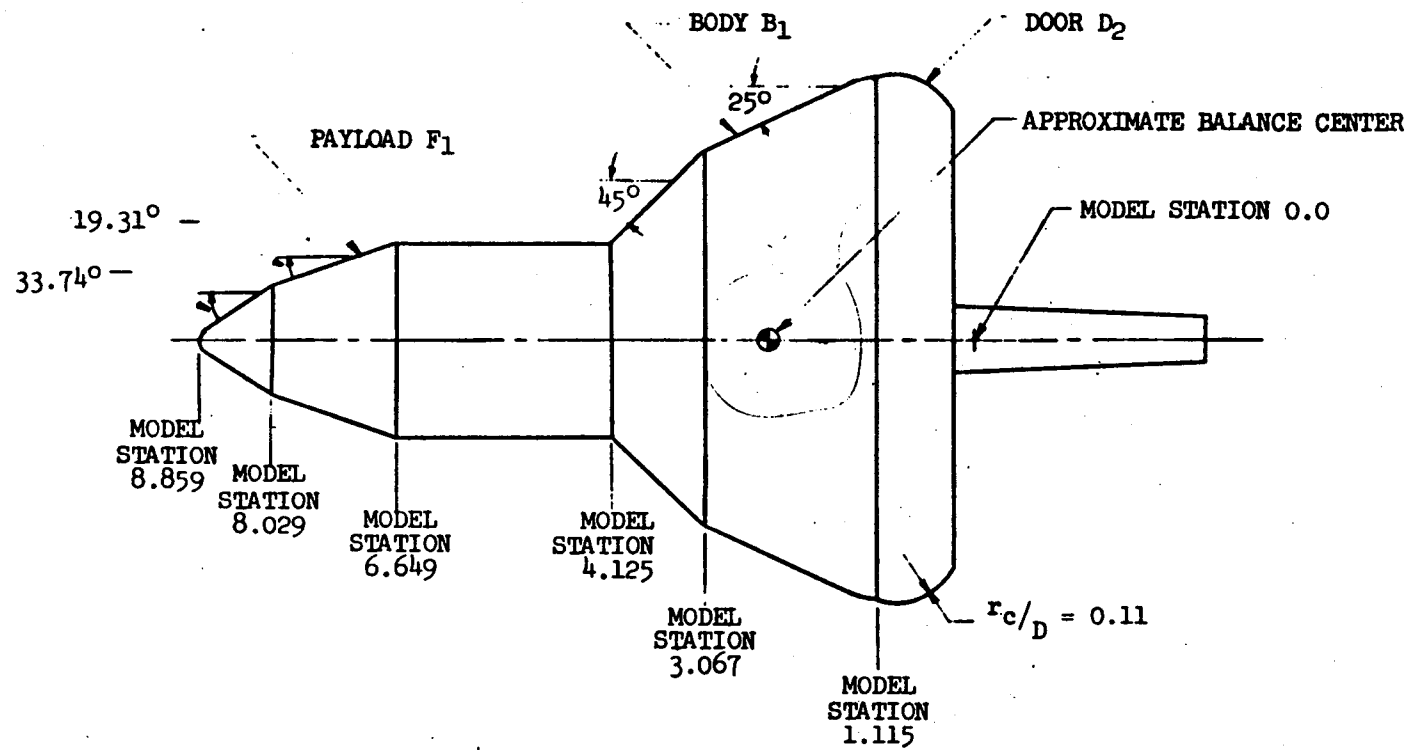


FIGURE 3. MODEL CONFIGURATION - F<sub>1</sub>B<sub>1</sub>D<sub>2</sub>

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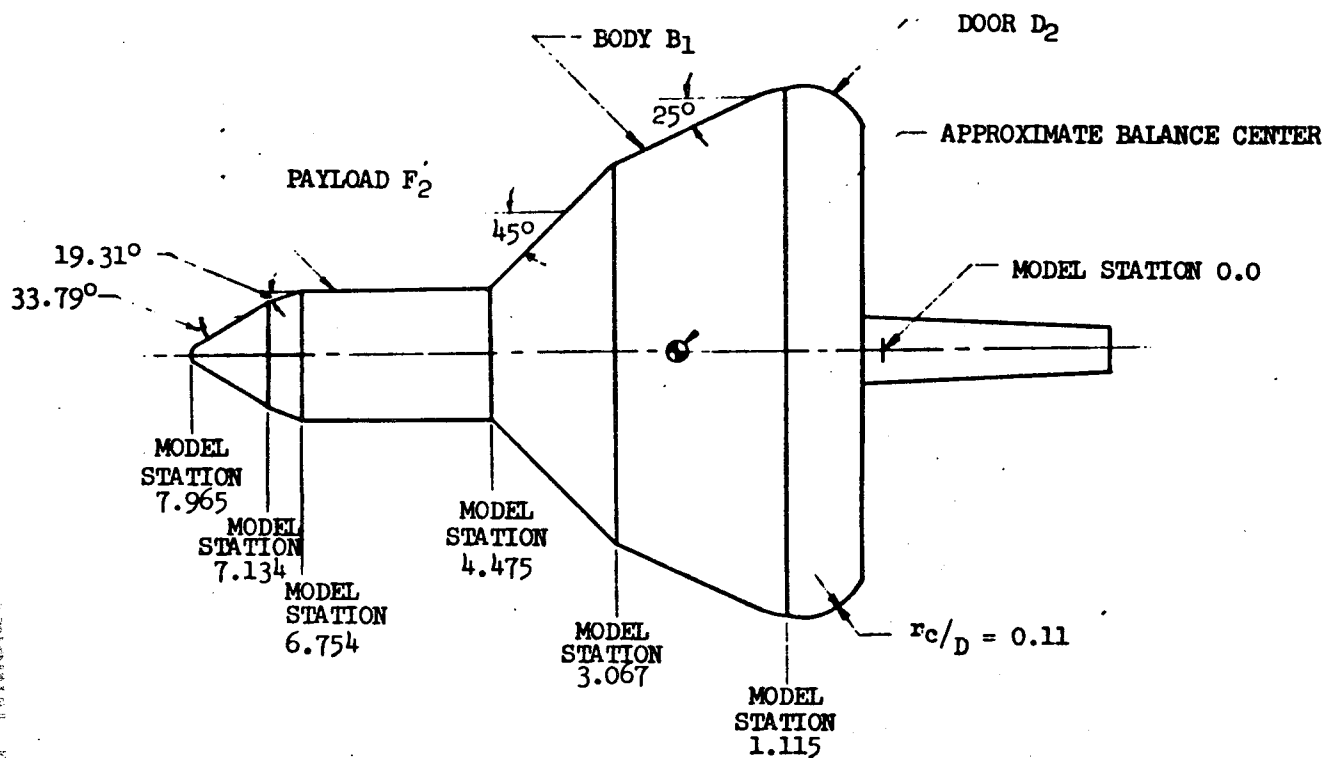


FIGURE 4. MODEL CONFIGURATION -  $F_2B_1D_2$

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1068 A-1- 557



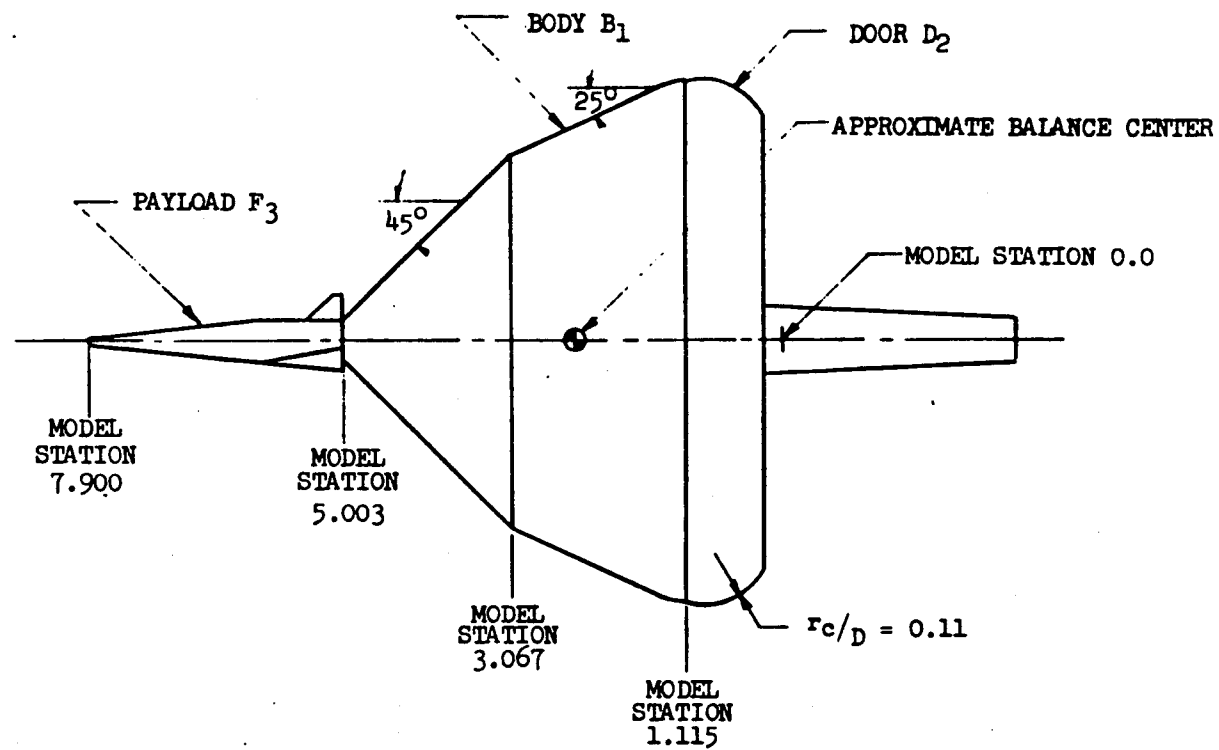


FIGURE 5. MODEL CONFIGURATION -  $F_3B_1D_2$

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REPRODUCED FROM  
NASA-MSFC-44P

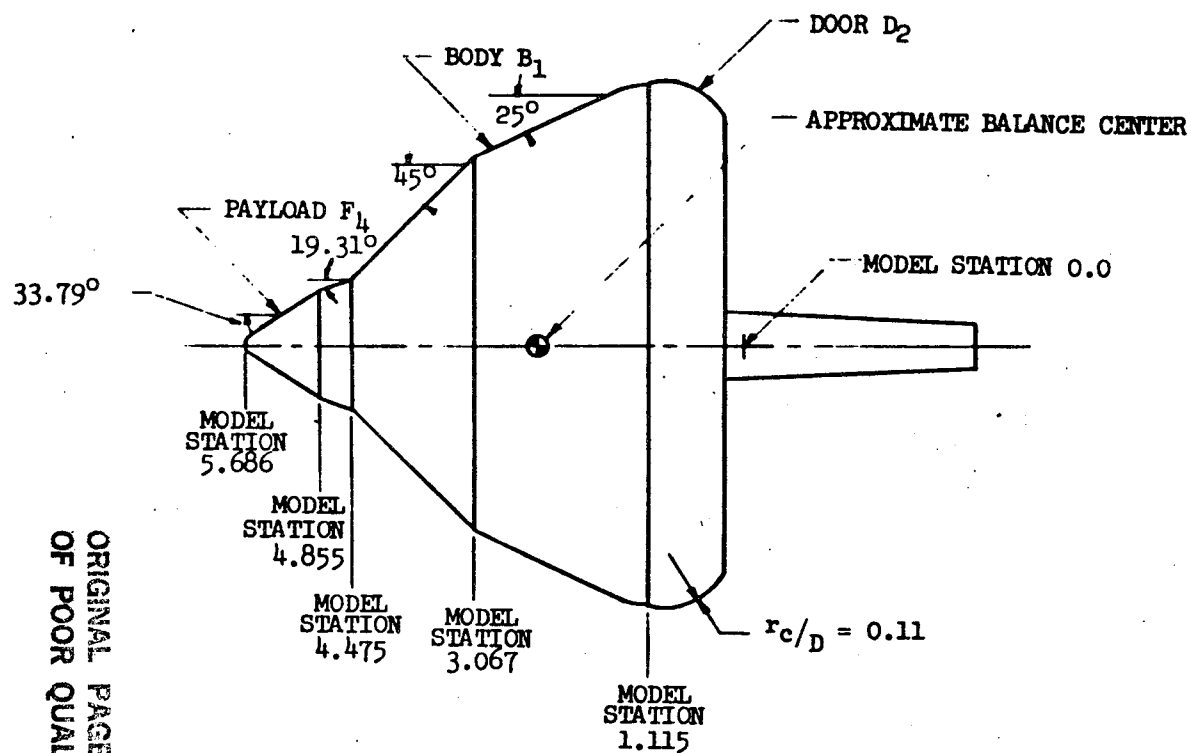


FIGURE 6. MODEL CONFIGURATION -  $F_4B_1D_2$

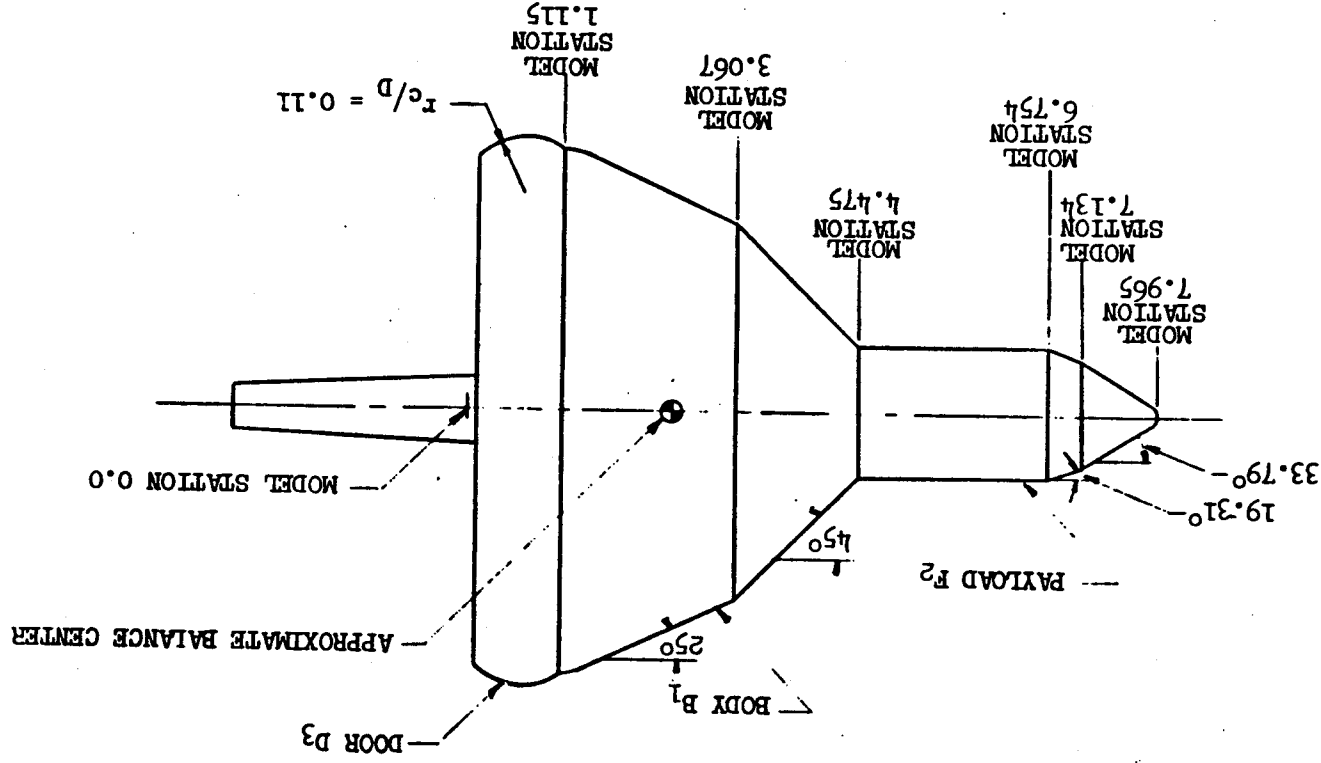


FIGURE 7. MODEL CONFIGURATION - F<sub>2</sub>B<sub>1</sub>D<sub>3</sub>

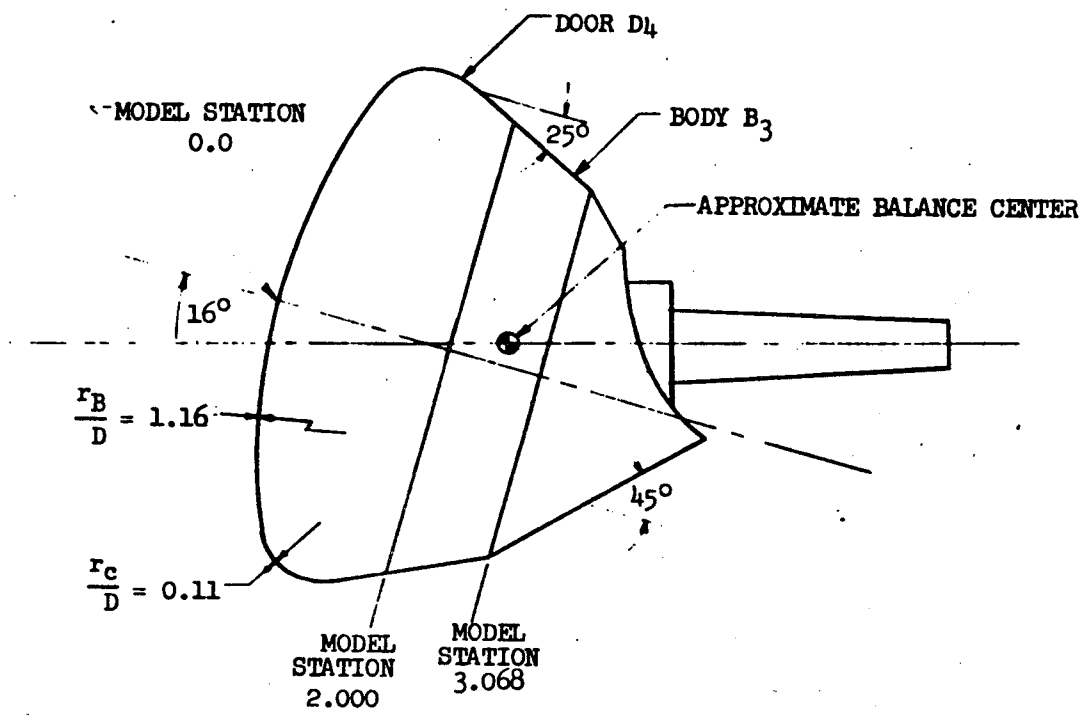


FIGURE 8. MODEL CONFIGURATION - OB<sub>3</sub>D<sub>4</sub>

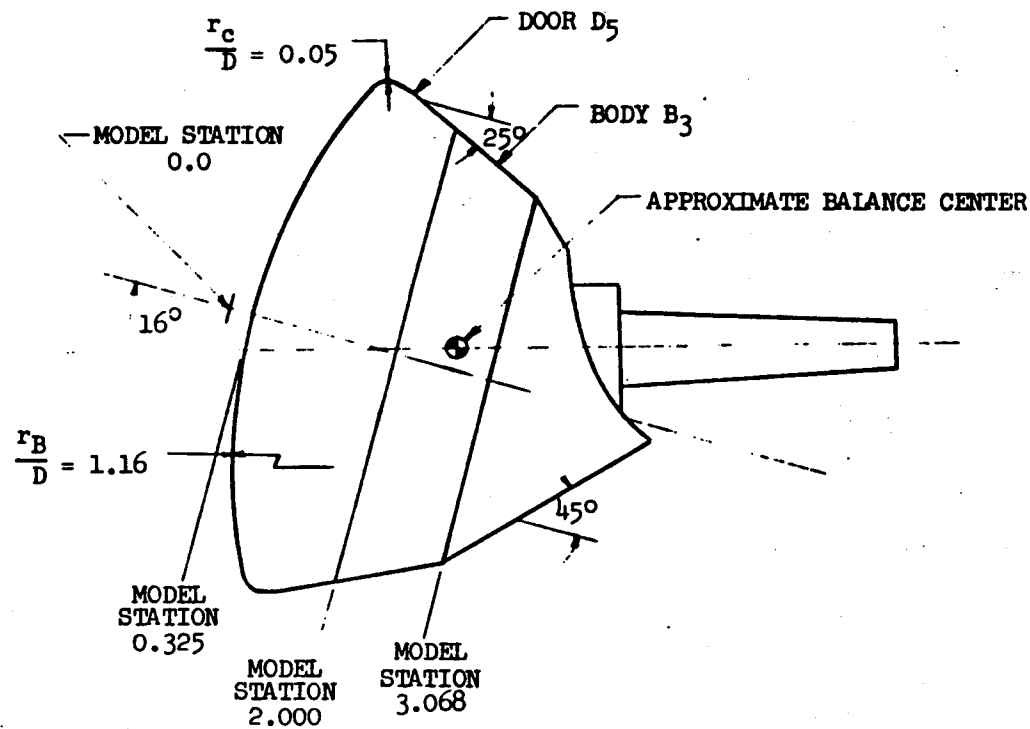


FIGURE 9. MODEL CONFIGURATION - OB<sub>3</sub>D<sub>5</sub>

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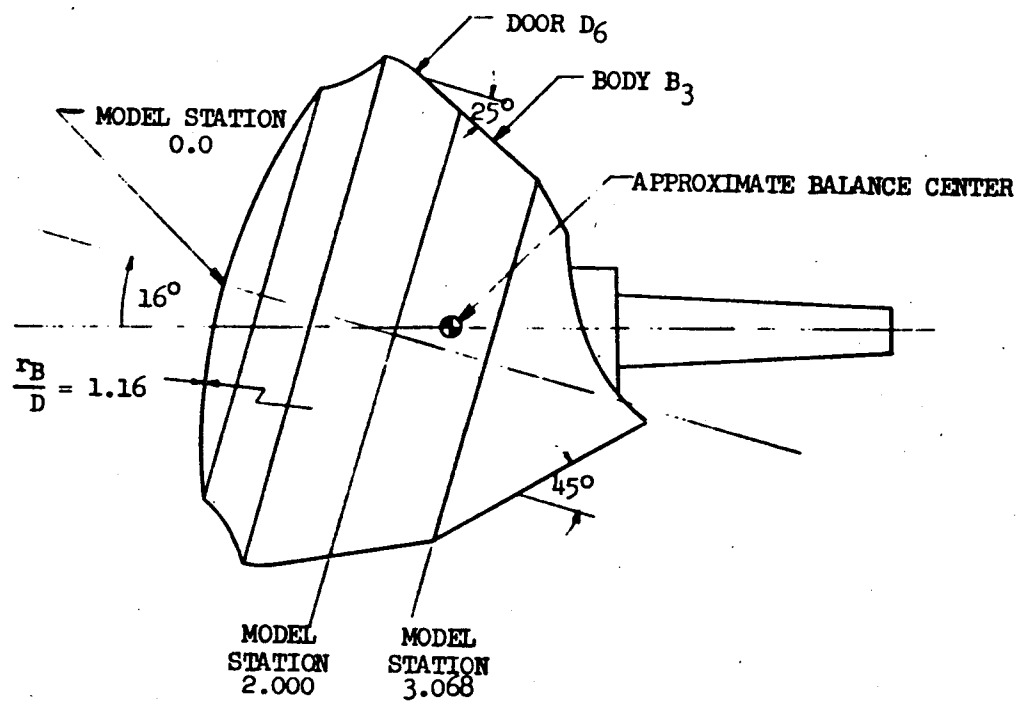


FIGURE 10. MODEL CONFIGURATION - OB<sub>3</sub>D<sub>6</sub>

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1068 A-1- 563

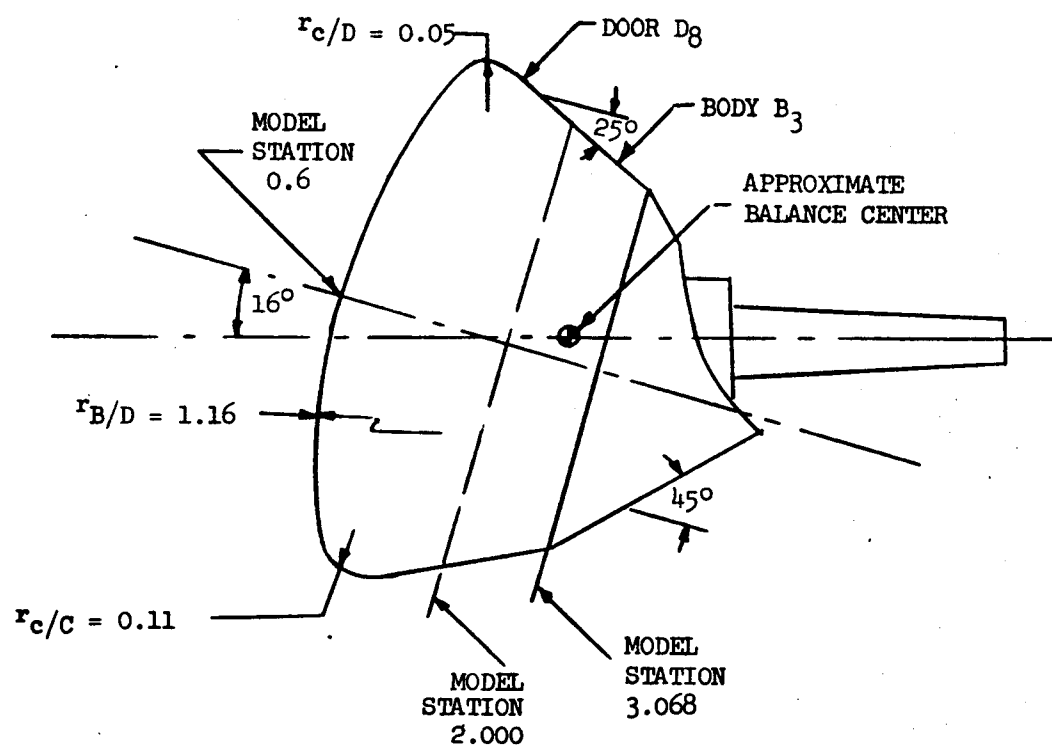


FIGURE 11. MODEL CONFIGURATION - OB<sub>3</sub>D<sub>8</sub>

8 MAR. 64

CHRYSLER CORPORATION

NASA-MSFC-MAF

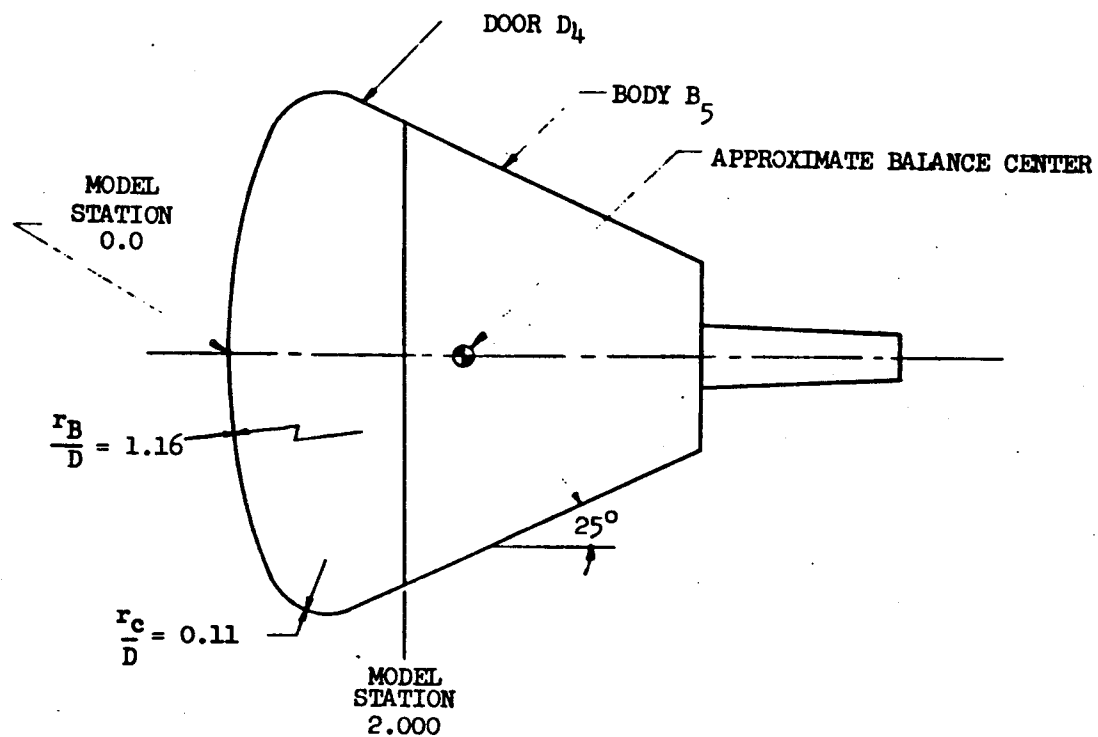


FIGURE 12. MODEL CONFIGURATION OB<sub>5</sub>D<sub>4</sub>

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1068 A-1- 565



# TEST Ames 66-522 DATA SET COLLATION SHEET

UNIQUE CONFIGS. BOOSTER

CCSD  
A-1- 566  
NR#1089

POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	PARAMETERS/VALUES	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)
R20001	F1B1D2	A	0 .11 0 .25	9	30 29 28 27 26 25 24 23 22
R20002	F2B1D2	A	0 .11 0 .25	10	60 59 58 57 56 55 54 53 52 51
R20003	F2B1D3	A	0 .11 0 .45	10	71 70 69 68 67 66 65 63 62 61
R20004	F3B1D2	C	0 .11 0 .25	10	40 39 38 37 36 35 34 33 32 31
R20005	F4B1D2	A	0 .11 0 .25	10	50 49 48 47 46 45 44 43 42 41
R20006	08204	A	0 .11 0 .0	10	11 10 9 8 7 6 5 4 3 1
R20007	08304	B	0 .11 0 .0	10	21 20 19 18 17 16 15 14 13 12
R20008	08404	D	0 .11 0 .0	10	81 80 79 78 77 76 75 74 73 72
R20009	08306	A	0 .11 0 .05	10	101 100 99 98 97 96 95 94 93 92
R20010	08306	B	0 .11 0 .05	10	131 130 129 128 127 126 125 124 123 122
R20011	08406	E	0 .11 0 .05	10	141 140 139 138 137 136 135 134 133 132
R20012	08207	A	0 .11 0 .	10	148 147 146 145 144 143 142 141 140 139
R20013	08307	B	0 .11 0 .	10	121 120 119 118 117 116 115 114 113 112
R20014	08407	E	0 .11 0 .	10	91 89 88 87 86 85 84 83 82 81

1	7	13	19	25	31	37	43	49	55	61	67	73	79
DN	08	08	08	08	08	08	08	08	08	08	08	08	08
COEFFICIENTS:													
a or b													
SCHEDULES													
IDPVAR(1) IDPVAR(2) NDV													
A-1.4 = 1.8													
B(4.0 = 3.4)													
C(2.0 = 5.5)													
D(1.5 = 1.5)													

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TEST LARC 9143 DATA SET COLLATION SHEET

☐ PRETEST  
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B	R/D	Beta	Expt		2.6	3.85	4.64							
RRL001	F1B1D2	A	0	.11	0	25°	3	3	1	2							
2	F2B1D2	T						4	5	6							
3	F3B1D2	T						9	7	6							
4	F4B1D2	T				25°	3	10	11	12							
5	F2B1D3	A				45°	2	15	13								
6	F2B1D3	D				45°	1			14							
7	OB3D4	B		.11		0	3	16	17	18							
8	OB3D5	T		.05		0		19	20	21							
9	OB3D6	T				OFF		24	22	23							
10	OB3D8	B		.08		0		25	26	27							
RRL 11	OB5D4	C	0	.11	0	0	3	28	29	30							

1 7 13 19 25 31 37 43 49 55 61 67 75 76  
 CN 1A 1LH RL 1C0 L/D LAF LAB MACH ALPHA 8  
 COEFFICIENTS: A(-4-2-1, 0, 1, 2, 4, 6, 8, 10, 12, 14, 16, 0)  
 B(6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 16)  
 C(-4-2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 26, 30, 34, 0)  
 D(-4-2, 0, 1, 2, 4, 6, 8, 10, 12, 14, 16, 0)  
 IDPVAR(1) IDPVAR(2) NDV

NASA-MSFC-MAF

UNIQUE CONFIGS. BOOSTER  
 CCSD  
 DR#1089 A-1- 567

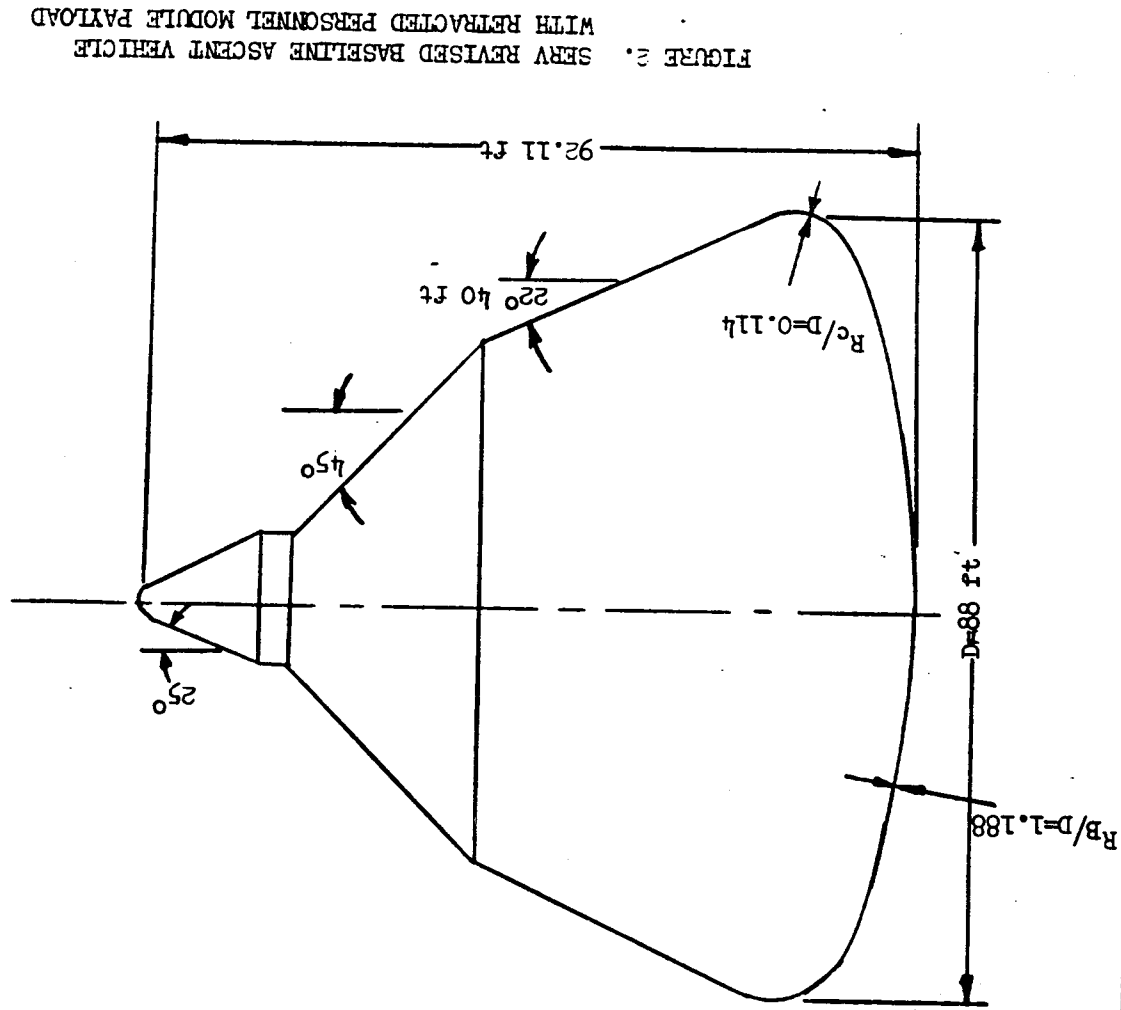


FIGURE 2. SERV REVISED BASELINE ASCENT VEHICLE  
WITH RETRACTED PERSONNEL MODULE PAYLOAD

UNIQUE CONFIGS. BOOSTER  
 CCSD  
 DR#1089 A-1-568

NASA-MSFC-MAF

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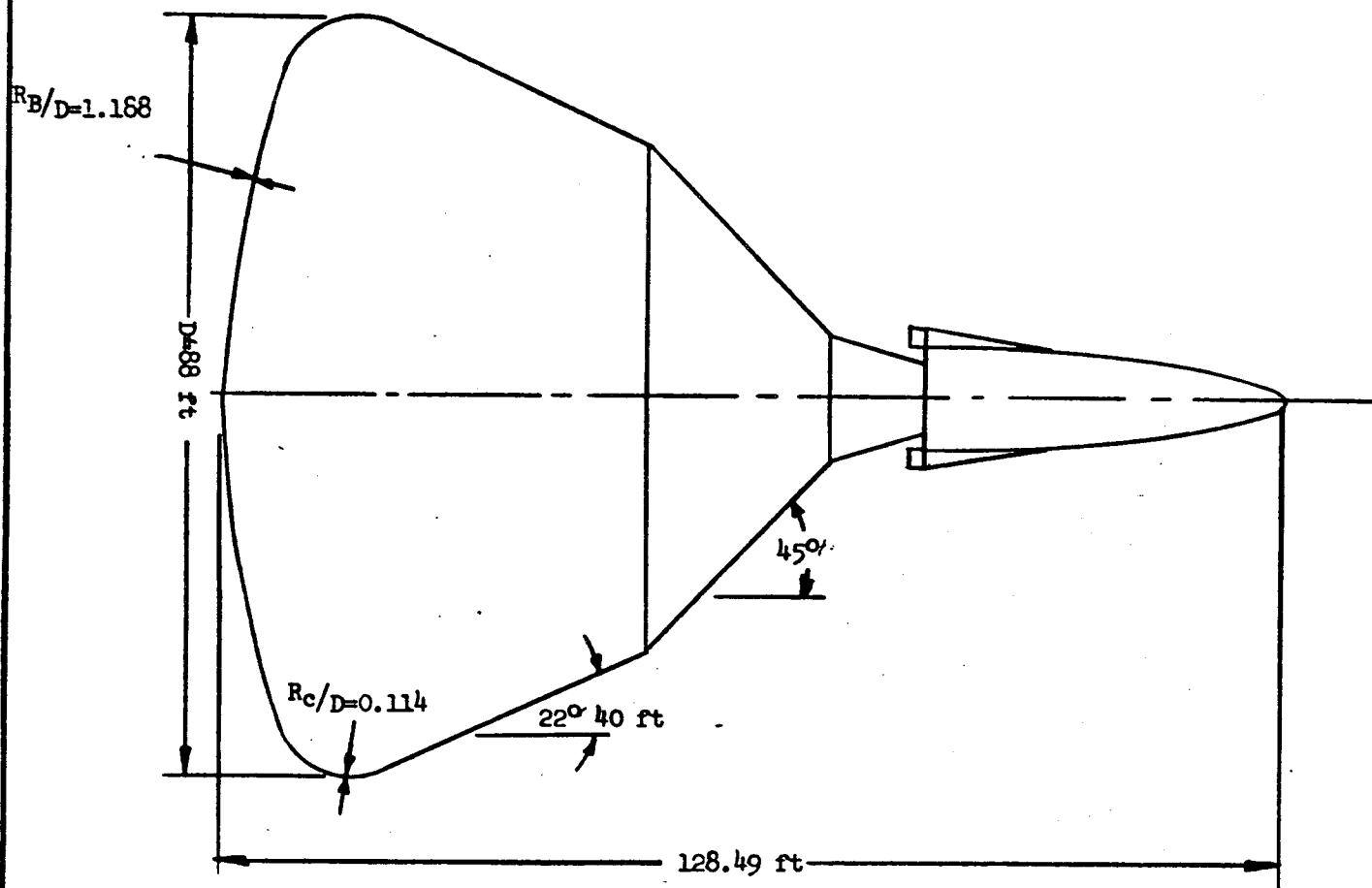


FIGURE 3. SERV REVISED BASELINE ASCENT VEHICLE  
WITH WINGED ORBITER PAYLOAD

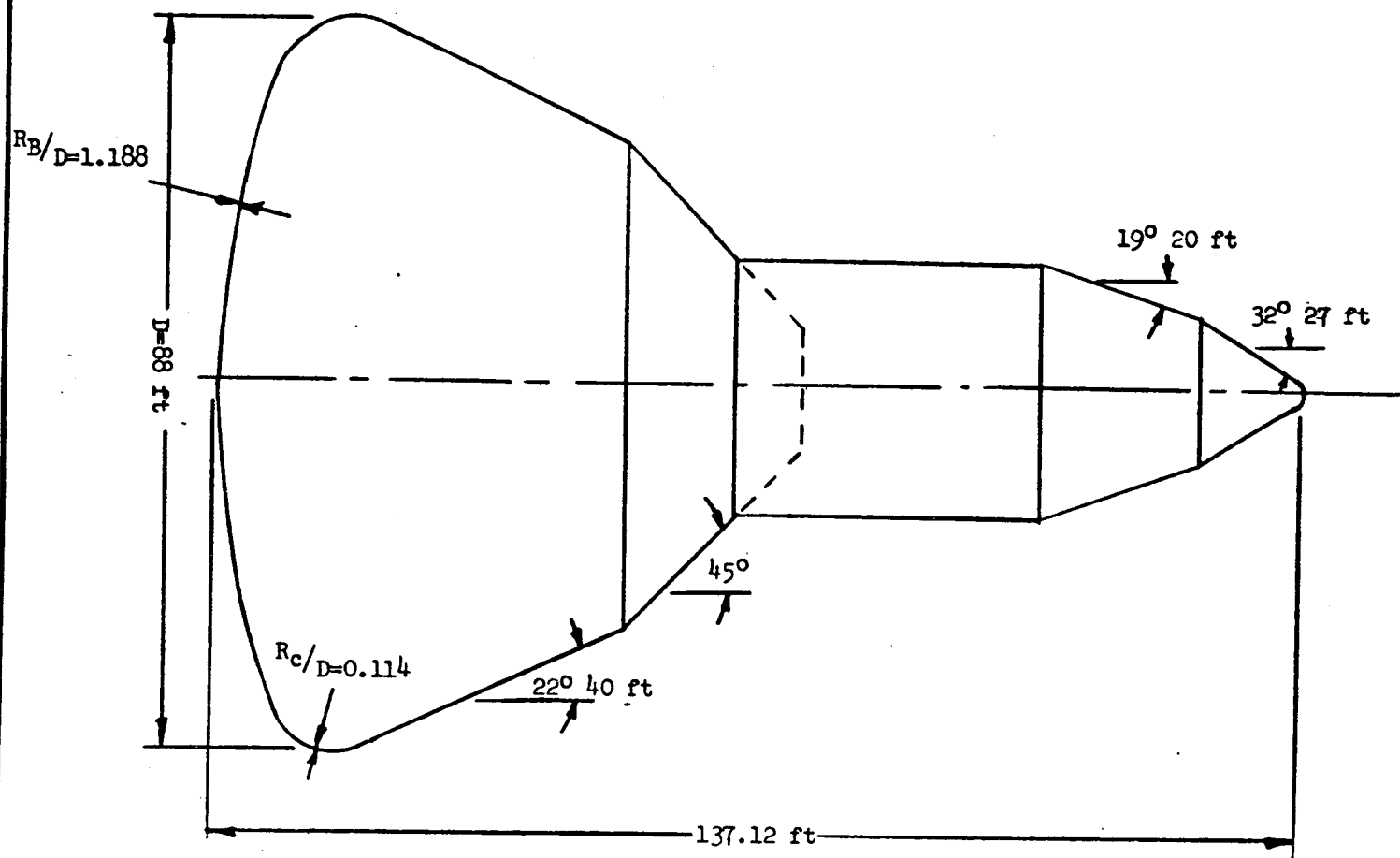


FIGURE 4. SERV REVISED BASELINE ASCENT VEHICLE  
WITH LARGE CARGO MODULE PAYLOAD

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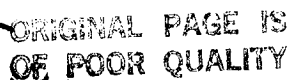


FIGURE 5. SERV REVISED BASELINE REENTRY VEHICLE

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1089 A-1- 571

# TEST AEDC VT0055 DATA SET COLLATION SHEET

UNIQUE CONFIGS. BOOSTER  
GD/C  
DR#1006 A-1- 572

Force - SAMSO - GD/Convair T-18 0.0182 Scale Model. Hypersonic Static Stability and Control Effectiveness.

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS										
		$\alpha$	$\beta$	$\delta_{CA}$	$\delta_{CL}$	$\delta_{PA}$	$\delta_{PL}$		10.0										
RT4011	BE	B	0	0	0	OFF	OFF	1	24										
RT4022	BE		+5	0	0	OFF	OFF	1	25										
RT4031	BEV		0	0	0	0	0	1	26										
RT4041	↑			+10	+10	0	0	1	27										
RT4051				+20	+20	0	0	1	28										
RT4061				+20	+20	+20	-20	1	29										
RT4071				+20	+20	+10	-10	1	30										
RT4081				+20	+20	+40	-40	1	31										
RT4091				-10	-10	0	0	1	32										
RT4101	↓			0	0	-40	+40	1	33										
RT4111	BEV	B	↓	0	0	+20	-20	1	34										
RT4123	BE	A	0	0	0	OFF	OFF	1	54										
RT4134	BE		+5	0	0	OFF	OFF	1	55										
RT4143	BEV		0	0	0	0	0	1	56										
RT4154	↑		+5	0	0	0	0	1	57										
RT4163			0	+10	+10	0	0	1	58										
RT4173				-10	-10	0	0	1	59										
RT4183				-20	-20	0	0	1	60										
RT4193	↓			0	0	+20	-20	1	61										
RT4203	BEV	A	0	0	0	-40	+40	1	62										

COEFFICIENTS:

1 7 13 19 25 31 37 43 49 55 61  
C<sub>NM</sub> C<sub>N</sub> C<sub>YM</sub> C<sub>Y</sub> C<sub>RL</sub> C<sub>A</sub> TOTL C<sub>A</sub> BASE C<sub>L</sub> C<sub>D</sub> 9

$\alpha$  or  $\beta$   
SCHEDULES

$\alpha A = 30$  TO  $55$ ;  $\Delta \alpha = 5$   $\beta D = -8$  TO  $8$ ;  $\Delta \beta = 2$   
 $\alpha B = 8, 10$  TO  $35$ ;  $\Delta \alpha = 5$

B = BODY  
E = SPLIT ELEVON  
V = VEE TAIL

NDV

CUFFET 10P

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Force - SAMS0 - GD/Convair T-18 0.0182 Scale Model. Hypersonic Static Stability and Control Effectiveness.

☒ POSTTEST

[illegible]

**a or b  
SCHEDULES**

$$\alpha A = 30 \text{ to } 55; \Delta \alpha = 5 \quad \beta D = -8 \text{ to } 8; \Delta \beta = 2$$

$$\alpha B = 8, 10 \text{ to } 25; \Delta \alpha = 5$$

B = BODY  
E = SPLIT ELEVON  
V = VEE TAIL

UNIQUE  
CONFIGS.  
BOOSTER

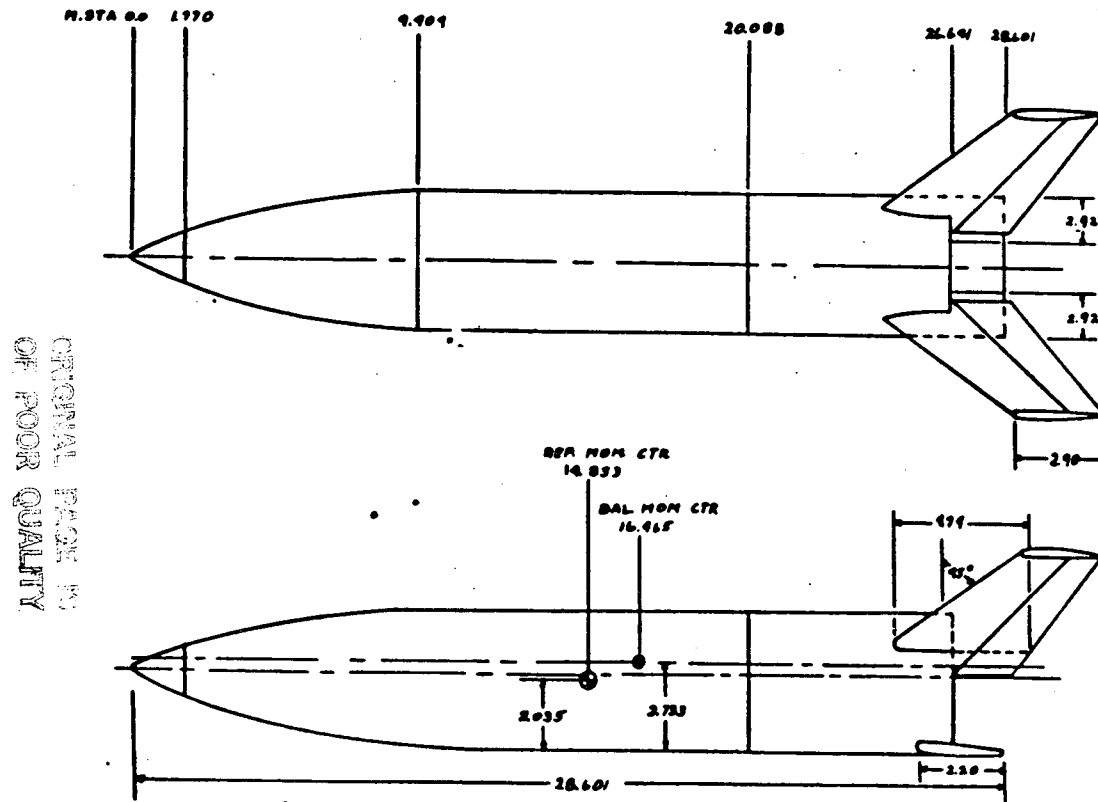
NDV

GD/C  
DR#1006 A-1- 573

OF POOR QUALITY



UNIQUE CONFIGS. BOOSTER  
GD/C  
DR#1006 A-1- 574



NOTE:  
ALL MODEL STATIONS AND  
DIMENSIONS ARE IN INCHES

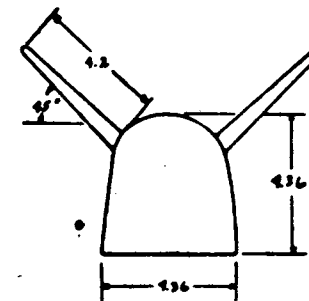


Figure 2. 3-View Sketch of a 0.0182 Scale Model of the GD/Convair (T-18) Booster.

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DATA SET IDENTIFIER	CONFIGURATION	SCHD.		NO. OF RUNS	CONTROL DEFLECTION	REYNOLDS NUMBERS x 10 <sup>-6</sup> Per Foot										
		a	B			2.5	4.0	5.0	6.0	7.0	8.0	10.0	12.0	12.5	14.5	

15001	BM1P1VH	A	0	0	6	4	5		6	7	8	9				
002	BM1P3VH	A	0	0	1							10				
003	BM1P5VH	A	0	0	1							11				
004	BM1AP5VH	A	0	0	1							12				
005	BM1AP3VH	A	0	0	1							13				
006	BM1AP1VH	A	0	0	1							14				
007	BM1P3V	A	0	0	1							15				
008	BM2P1VH	A	0	0	6	16	17	18	19	20	21					
009	BM2P3VH	A	0	0	1							22				
010	BM2P5VH	A	0	0	1							23				
011	BM2AP5VH	A	0	0	1							24				
012	BM2AP3VH	A	0	0	1							25				
013	BM2AP1VH	A	0	0	1							26				
014	BM2P1V	A	0	0	1							27				
019	BM2P3V	A	0	0	1							28				
016	BM2P5VH	A	0	-20	1							29				
017	BM2P3VH	A	0	+20	1							30				
018	BM2P3V	A	0	0	1							31				
019	BM2P3V	A	0	0	1							32				
020	BM3P1VH	A	0	0	4	33		34	35	36						

A-6, 4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22

AERO COEFFICIENTS:

CN, CA, CLM, PLUS 9(PSE)

8 of 8  
SCHEDULES

UNIQUE CONFIGS. BOOSTER  
LARC  
DR#1015 A-1-575

## DATA ORGANIZATION

**SHEET**

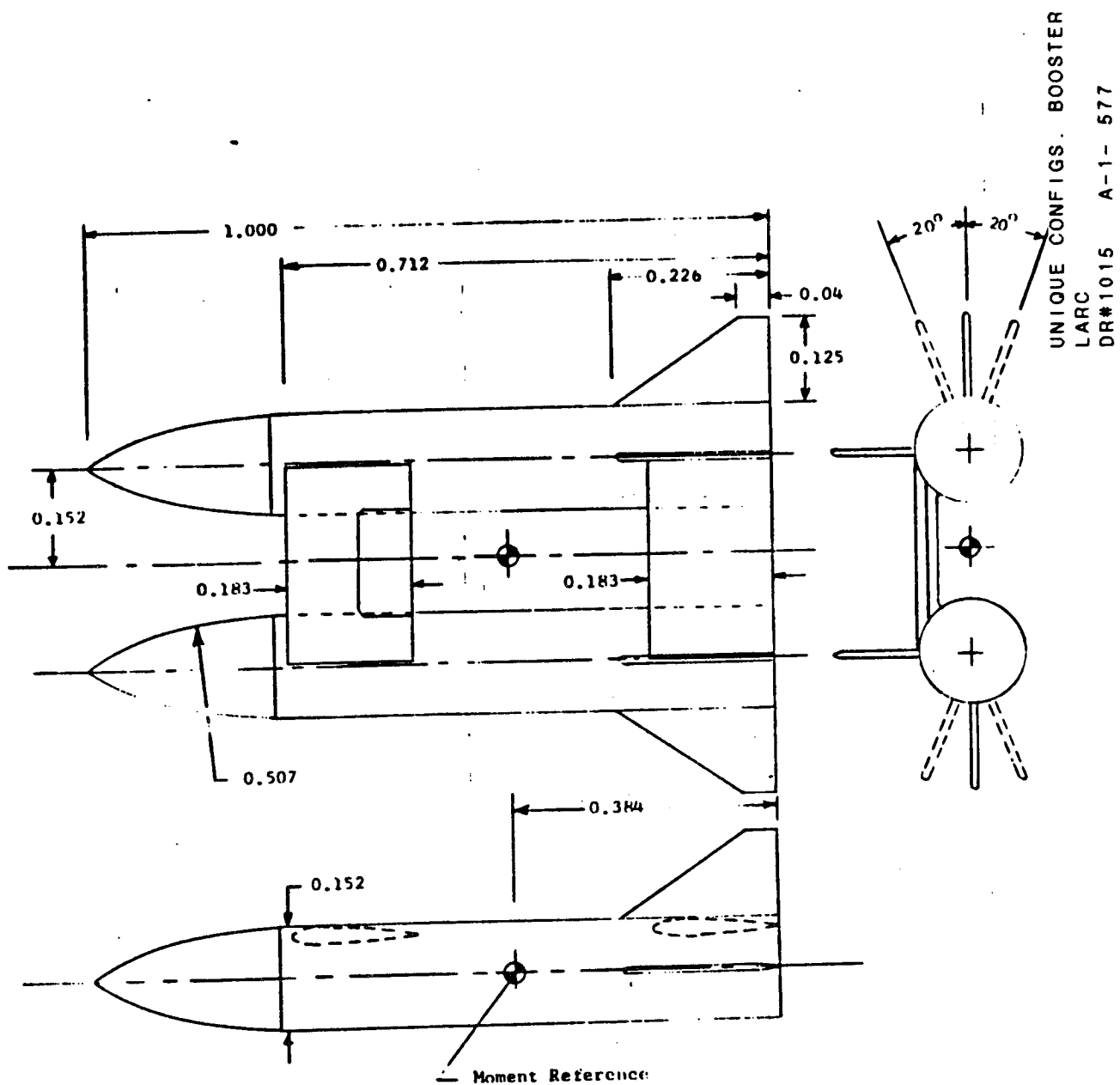
UNIQUE CONFIGS. BOOSTER  
LARC  
DR#1015 A-1- 576

[illegible]

.A -6, -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22

**a or  $\beta$**   
**SCHEDULES**

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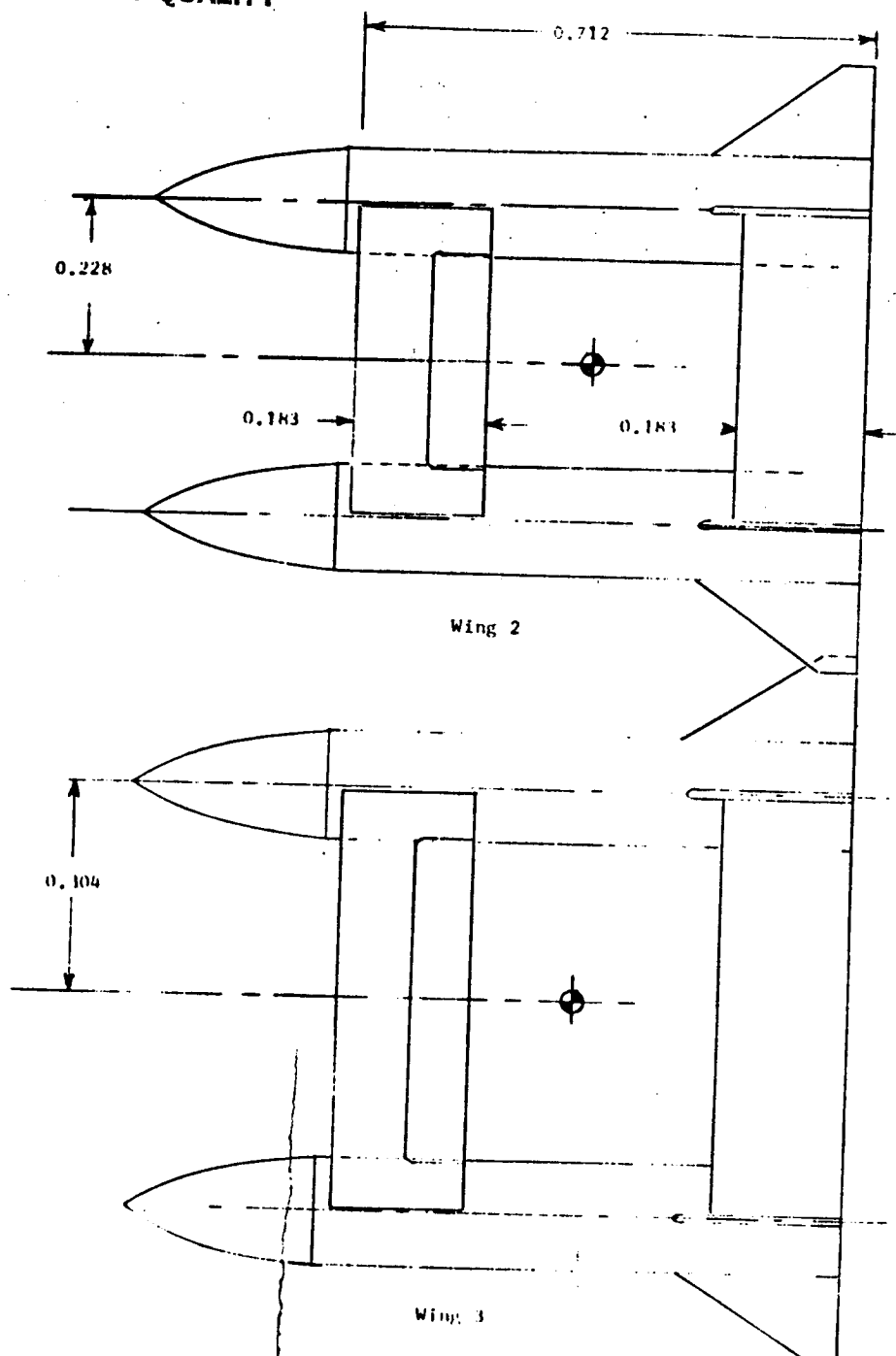


(a) Model with wing 1

Figure 2 Sketch of model used in investigation. All dimensions are normalized with respect to body length. Body length = 20.8 inches (52.8 cm).

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UNIQUE CONFIGS. BOOSTER  
LARC  
DR#1015 A-1- 578

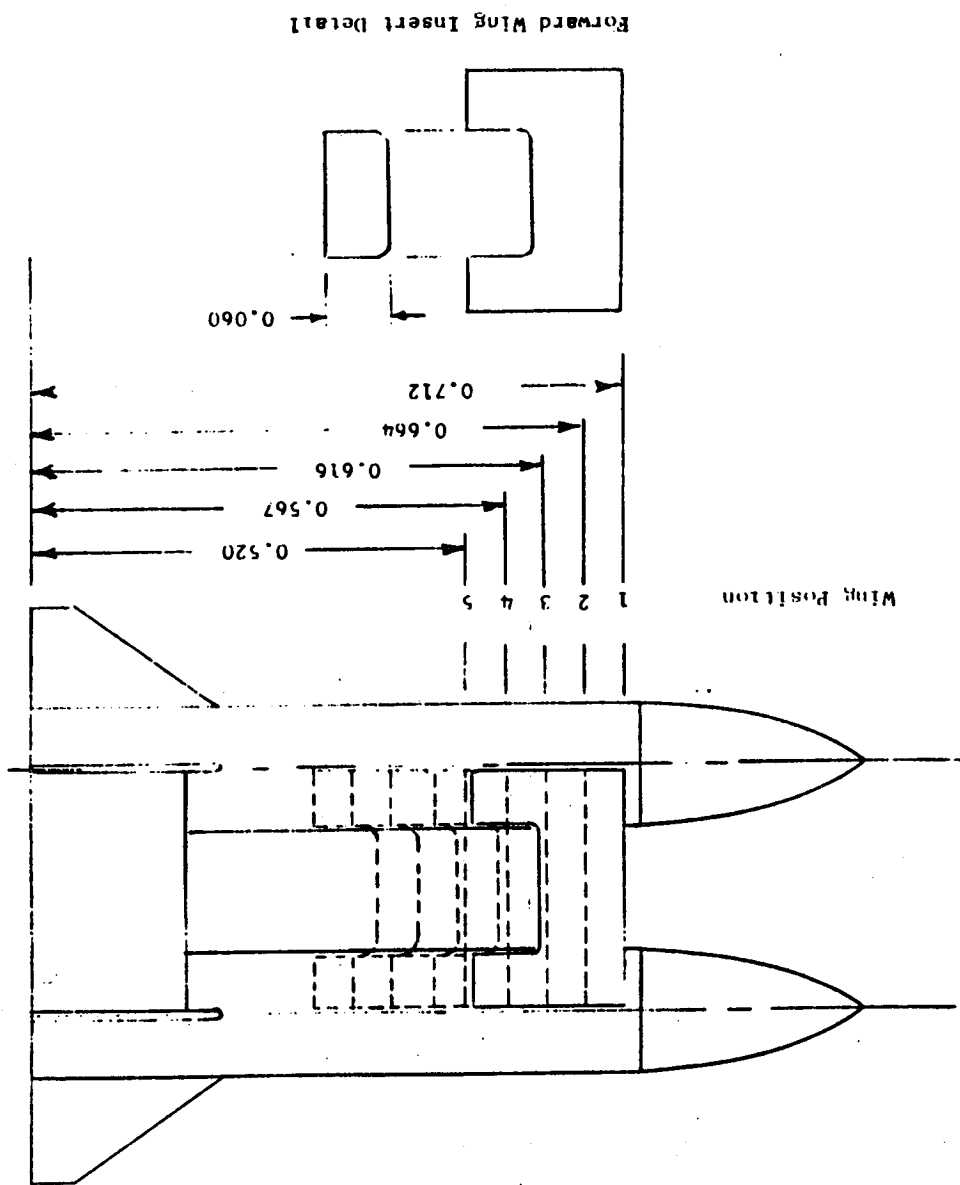


(b) Model with wings 2 and 3.

Figure 2 - Continued.

Figure 2 - Concluded.

(c) Forward wing positions



TEST : LARC UPWT 886

DATA

ORGANIZATION

SHEET

UNIQUE CONFIGS. BOOSTER

LARC

DR#1017

A-1- 580

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS									
		$\alpha$	$\beta$						1.50	1.90	2.36	2.86						
RL4001	BW1P1VH	A	0					4	126	129	131	135						
002	BW1P3VH	A	0					4	93	97	100	102						
003	BW1P5VH	A	0					4	146	147	149	152						
004	BW2P1VH	A	0					4	69	71	73	76						
005	BW2P3VH	A	0					4	6	11	17	27						
006	BW2P5VH	A	0					4	81	84	86	87						
007	BW3P1VH	A	0					4	181	184	186	187						
008	BW3P3VH	A	0					4	153	156	158	159						
009	BW3P5VH	A	0					4	197	200	202	203						
010	BW1P3	A	0					4	113	117	119	123						
011	BW1P3V	A	0					4	109	110	111	112						
012	BW1AP3VH	A	0					4	107	108	105	106						
013	BW2P3	A	0					4	59	63	54	57						
014	BW2P3V	A	0					4	49	50	51	52						
015	BW2AP3VH	A	0					4	31	32	29	30						
016	BW3P3	A	0					4	169	174	175	180						
017	BW3P3V	A	0					4	165	166	167	168						
018	BW3AP3VH	A	0					4	163	164	161	162						
019	BW1AP1VH	A	0					4	137	138	139	140						
020	BW1AP5VH	A	0					4	141	142	143	144						

A -4, -2, 0, 1, 2, 4, 6, 8, 10, 12, 16, 20, 22

B -8, -6, -4, -2, -1, 0, 1, 2, 4, 6, 8, 10, 12

$\alpha$  or  $\beta$   
SCHEDULES

INPUT: BETA,  $Q$ (PSF), CN, CA,  
CLM, CY, CYN, CBL

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DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS									
		$\alpha$	$\beta$	$\Gamma_t$					1.50	1.90	2.36	2.86						
RL4021	BW2AP1VH	A	0	0				4	79	80	77	78						
022	BW2AP5VH	A	0	0				4	91	92	89	90						
023	BW3AP1VH	A	0	0				4	189	190	191	192						
024	BW3AP5VH	A	0	0				4	193	194	195	196						
025	BW2P3AH	A	0	0				4	61	62	53	58						
026	BW1P3AH	A	0	0				4	115	116	121	122						
027	BW3P3AH	A	0	0				4	171	172	177	178						
028	BW2P3VH	A	0	-20				4	33	36	37	40						
029	BW2P3VH	A	0	20				4	45	48	41	44						
030	BW2P3VH	0	B	0				4	7	12	18	24						
031	BW2P3VH	8	B	0				4	8	13	19	25						
032	BW2P3VH	16	B	0				4	9	14	20	26						
033	BW2P3VH	A	4	0				4	10	15	21	28						
034	BW2P3VH	A	4	-20				4	34	35	38	39						
035	BW2P3VH	A	4	+20				4	46	47	42	43						
036	BW1P3VH	A	4	0				4	94	98	101	103						
037	BW1P3	A	4	0				4	114	118	120	124						
038	BW1P1VH	A	4	0				4	127	128	132	136						
039	BW2P3	A	4	0				4	60	64	55	56						
RL4040	BW3P3	A	4	0				4	170	173	176	179						

A -4, -2, 0, 1, 2, 4, 6, 8, 10, 12, 16, 20, 22

B -8, -6, -4, -2, -1, 0, 1, 2, 4, 6, 8, 10, 12

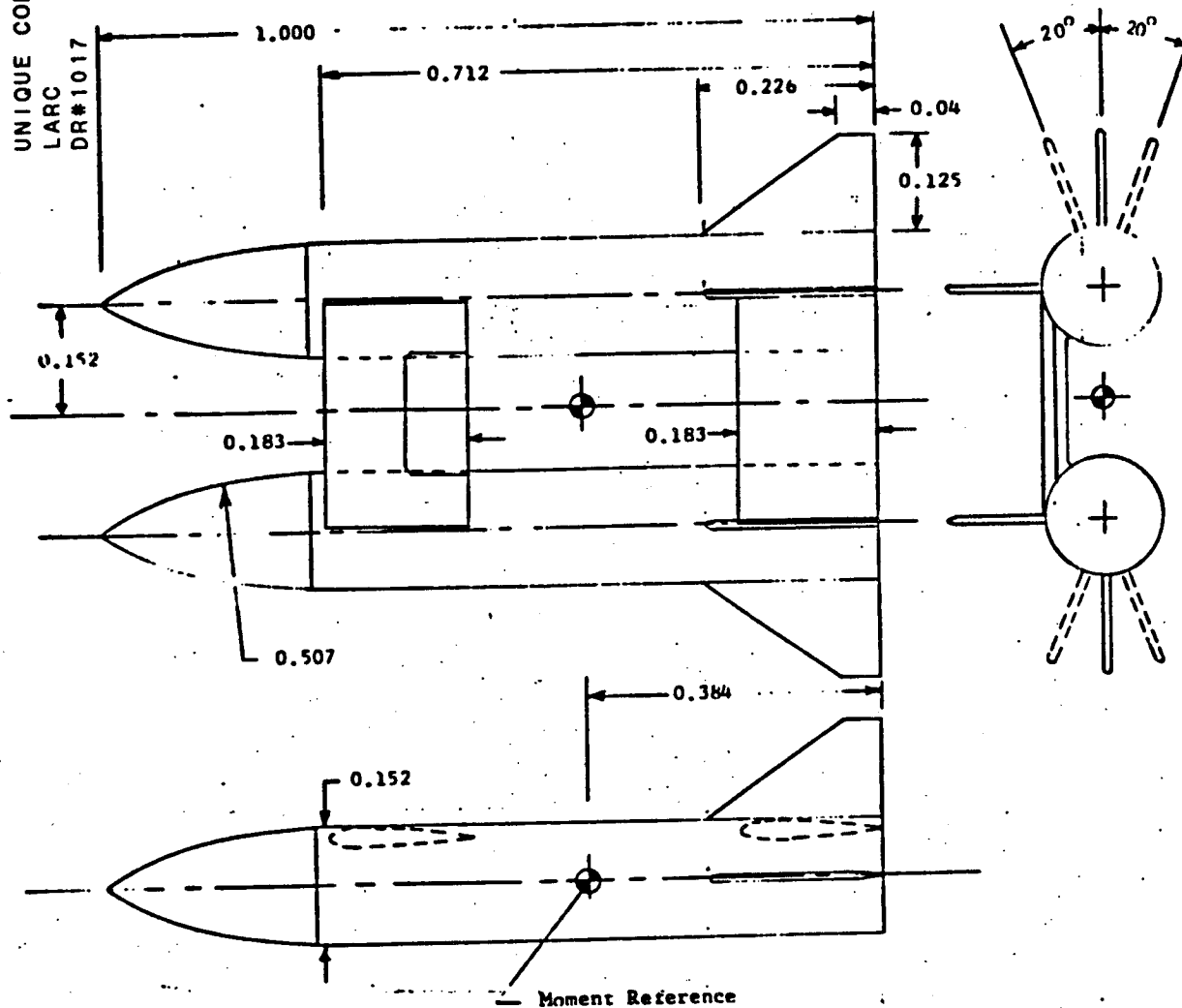
$\alpha$  or  $\beta$   
SCHEDULES

UNIQUE CONFIGS. BOOSTER  
LARC  
DR#1017 A-1- 581



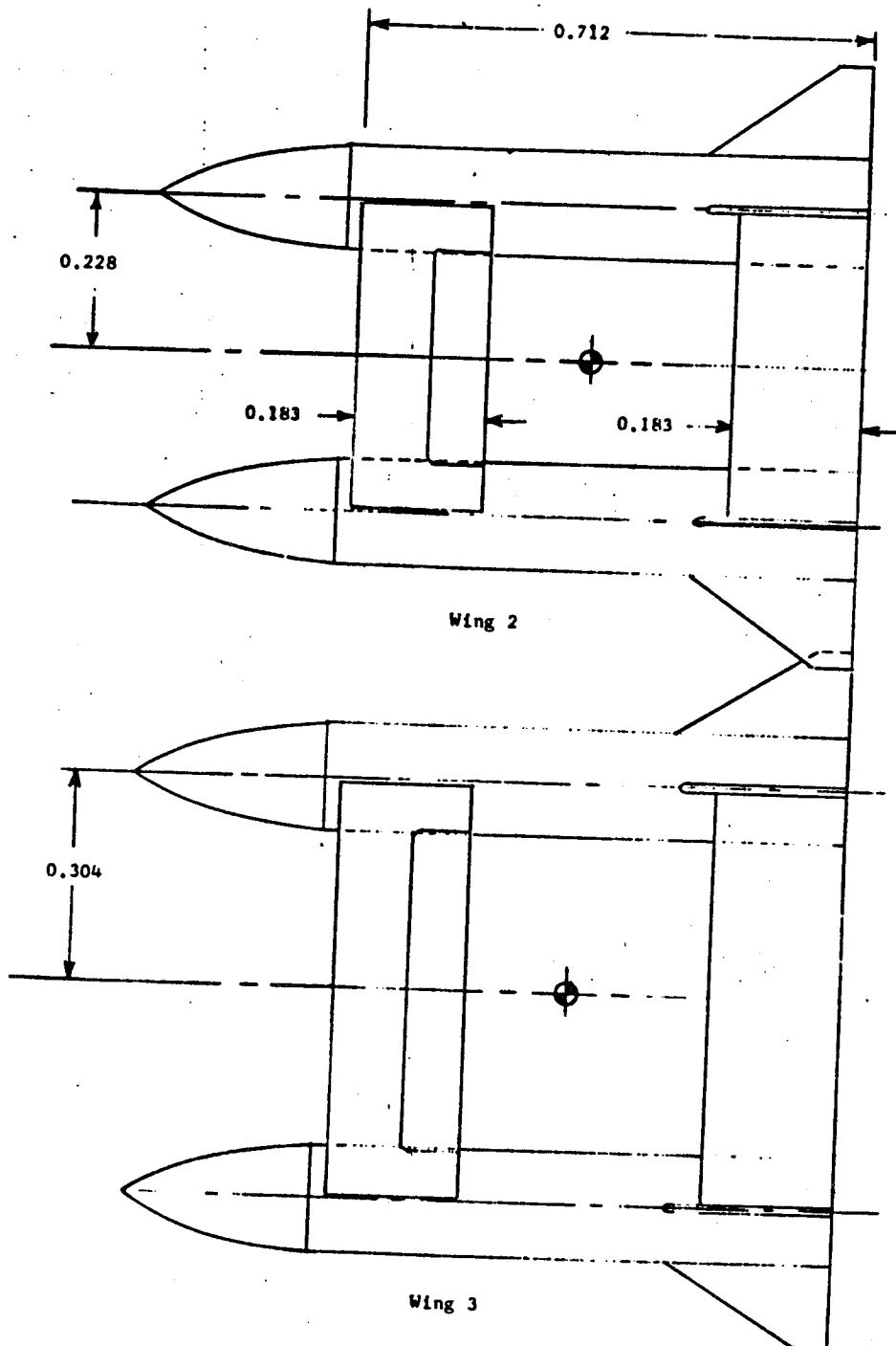
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LARC  
DR#1017 A-1- 582

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(a) Model with wing 1

Figure 2 Sketch of model used in investigation. All dimensions are normalized with respect to body length. Body length = 20.8 inches (52.8 cm).



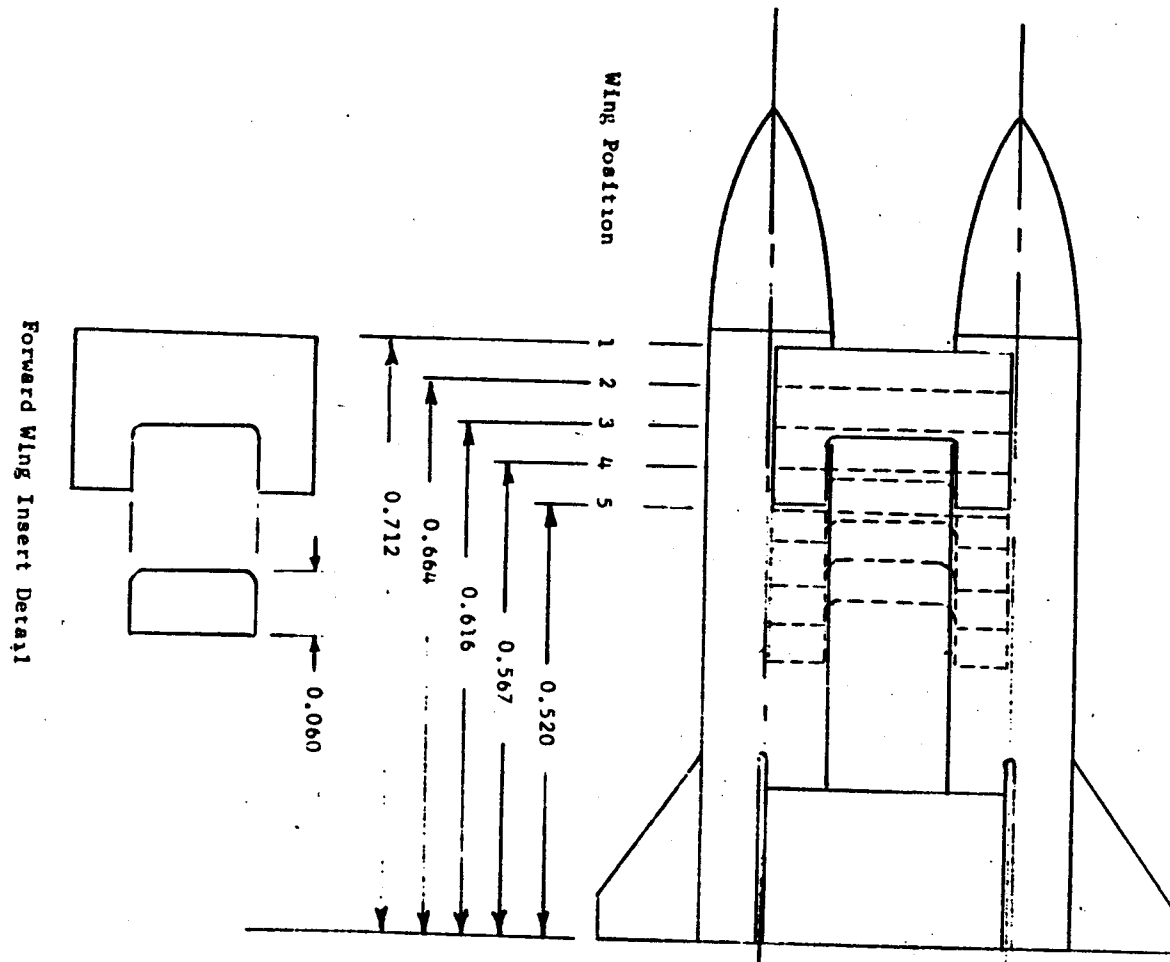
(b) Model with wings 2 and 3.

Figure 2 - Continued.

UNIQUE CONFIGS. BOOSTER  
LARC  
DR#1017 A-1- 583

676

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(c) Forward wing positions

Figure 2 - Concluded.

## LaRC UPWT 913

DATA

## ORGANIZATION

**SHEET**

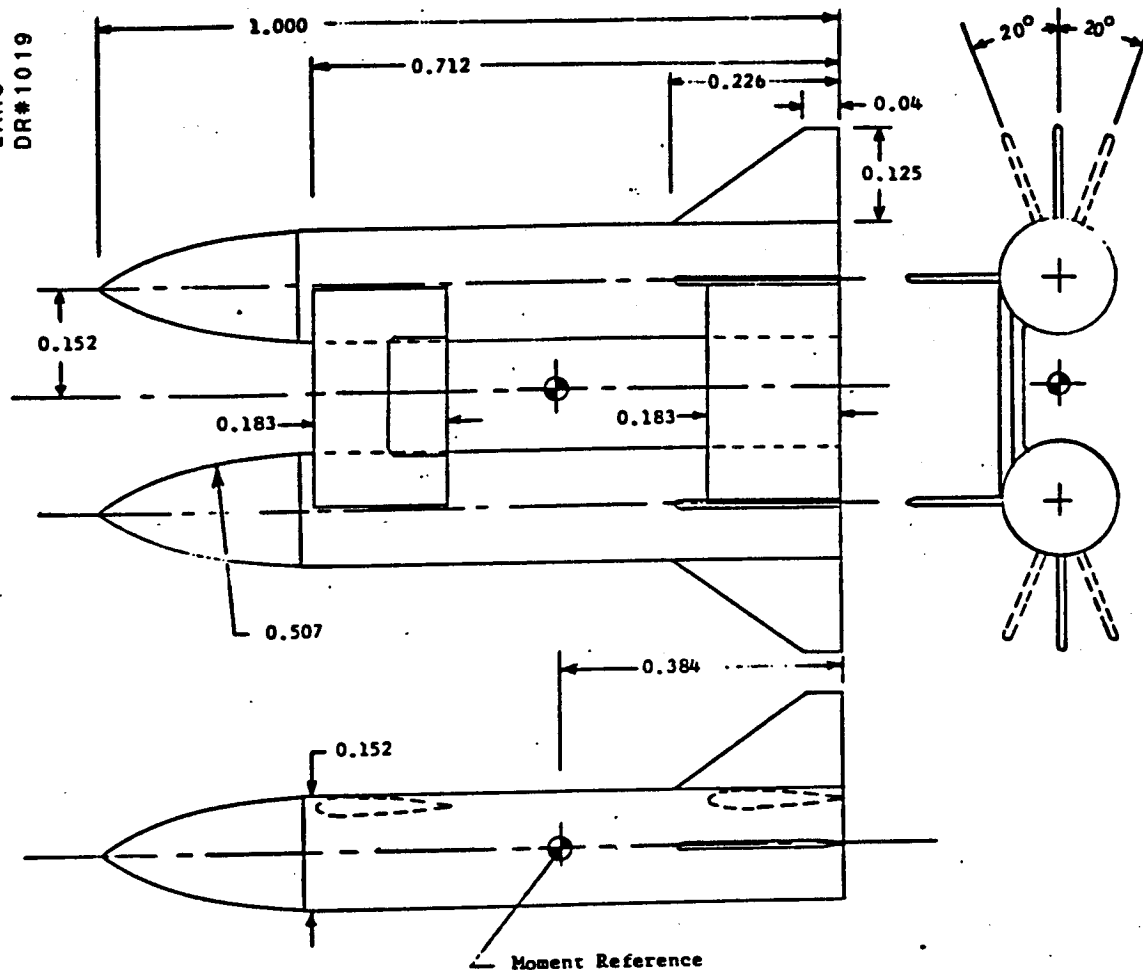
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$B = -8, -6, -4, -2, -1, 0, 1, 2, 4, 6, 8, 10, 12$

UNIQUE CONFIGS. BOOSTER  
LARC  
DR#1019 A-1- 585

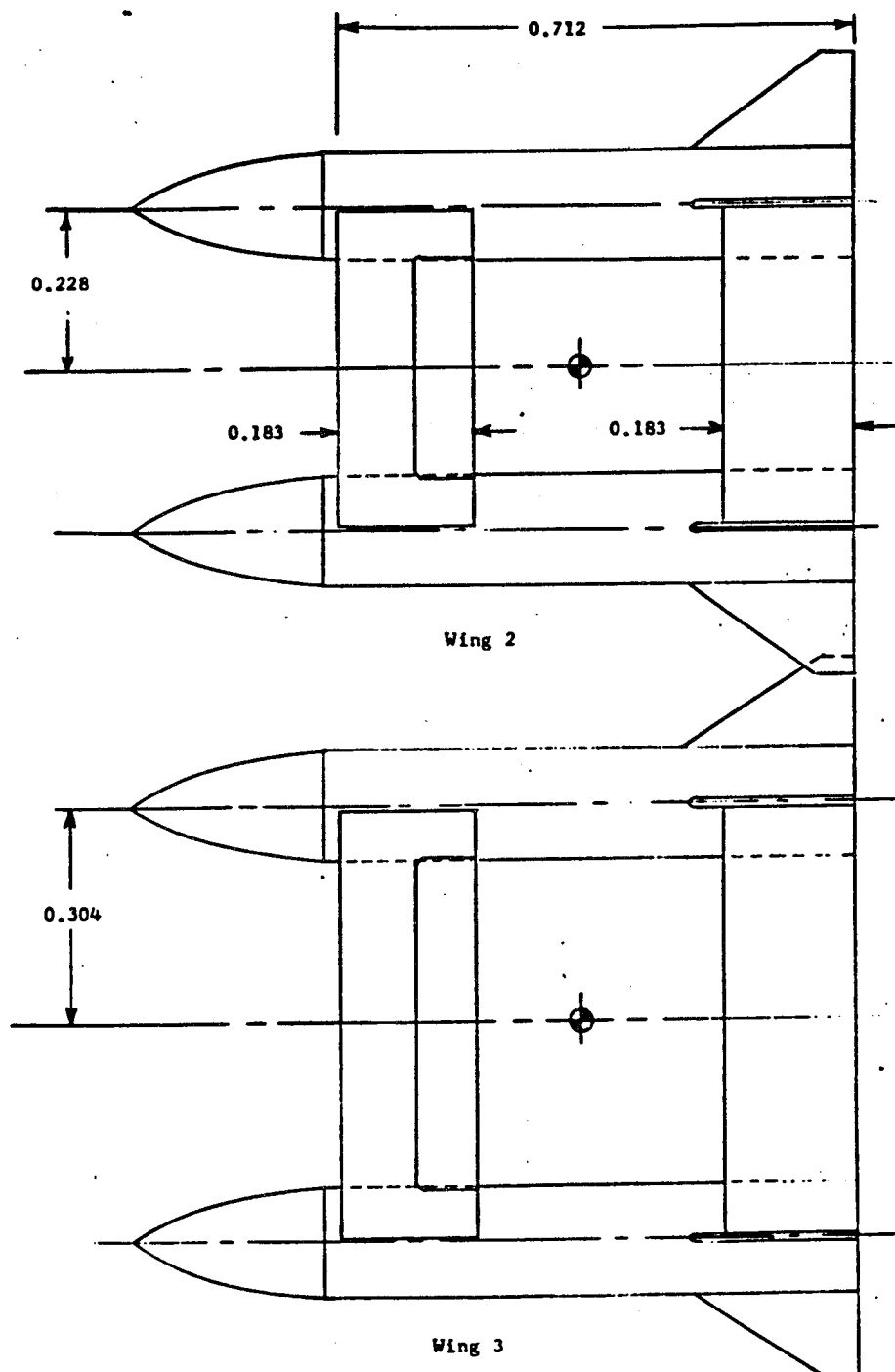
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UNIQUE CONFIGS. BOOSTER  
LARC  
DR#1019 A-1-586



(a) Model with wing 1

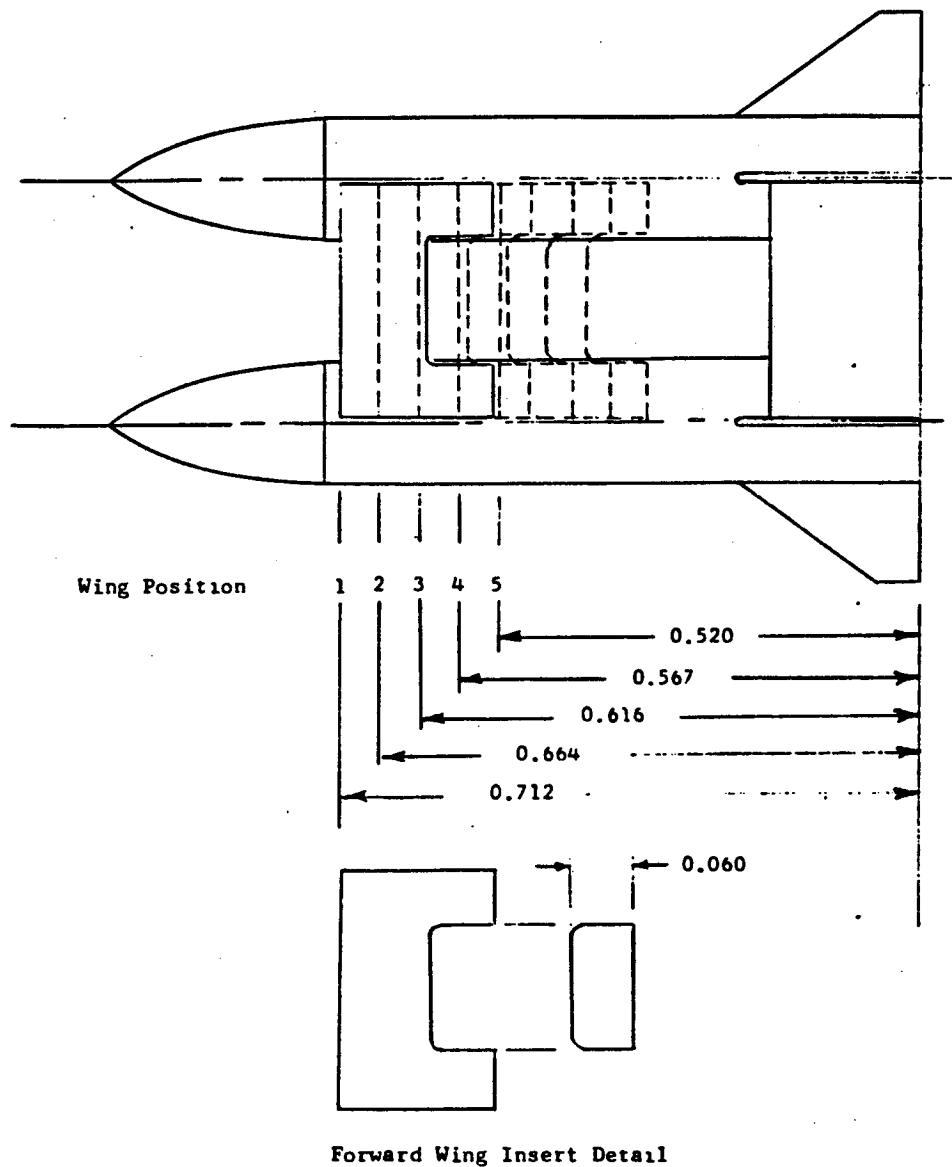
Figure 2 | Sketch of model used in investigation. All dimensions are normalized with respect to body length. Body length = 20.8 inches (52.8 cm).



(b) Model with wings 2 and 3.

Figure 2 - Continued.

UNIQUE CONFIGS. BOOSTER  
LARC  
DR#1019 A-1- 588



(c) Forward wing positions

Figure 2 - Concluded.

TABLE II.  
TEST LTPT - 73 DATA SET/RUN NUMBER  
COLLATION SUMMARY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RUNS	REYNOLDS NUMBERS											
		$\alpha$	$\beta$	$\delta_e$	$\delta_c$			2.5	4.0	6.0	8.0	10.0	12.0	14.0					
RMV 001	BWV <sub>1</sub> N <sub>1</sub>	A	0	0	-		7	1	2	3	4	5	6	7					
02	↓			-10			1					8							
03	↓			-20								9							
04	BWV <sub>1</sub> N <sub>1</sub> C			0	0							10							
05	↓			10								11							
06	↓			20								12							
07	BWN <sub>1</sub>			-								19							
08	BWN <sub>1</sub> C			0								20							
09	B <sub>2</sub> WV <sub>1</sub> N <sub>1</sub> C		Y									21							
10	BWV <sub>1</sub> N <sub>1</sub> C		5.0									13							
11	↓			20								14							
12	↓			10								15							
13	BWN <sub>1</sub> C			0								16							
14	BWN <sub>1</sub>			-								17							
Y 15	BWV <sub>1</sub> N <sub>1</sub>	Y	Y	Y	-		Y					18							

TEST RUN NUMBERS

1      7      13      19      25      31      37      43      49      55      61      67      75 76  
CN    CA    CAB    CLM    CY    CYN    CBL    CL    CD    L/D    RN/L    ALPHA    LO

COEFFICIENTS:

$\alpha$  or  $\beta$

SCHEDULES

A = -2.0, 0.0, 2.0, 4.0, 6.0, 8.0, 10.0, 12.0, 14.0, 16.0  
18.0, 20.0, 22.0, 24.0

→IDPVAR(1)IDPVAR(2)NDV

NASA-MSFC-MAF



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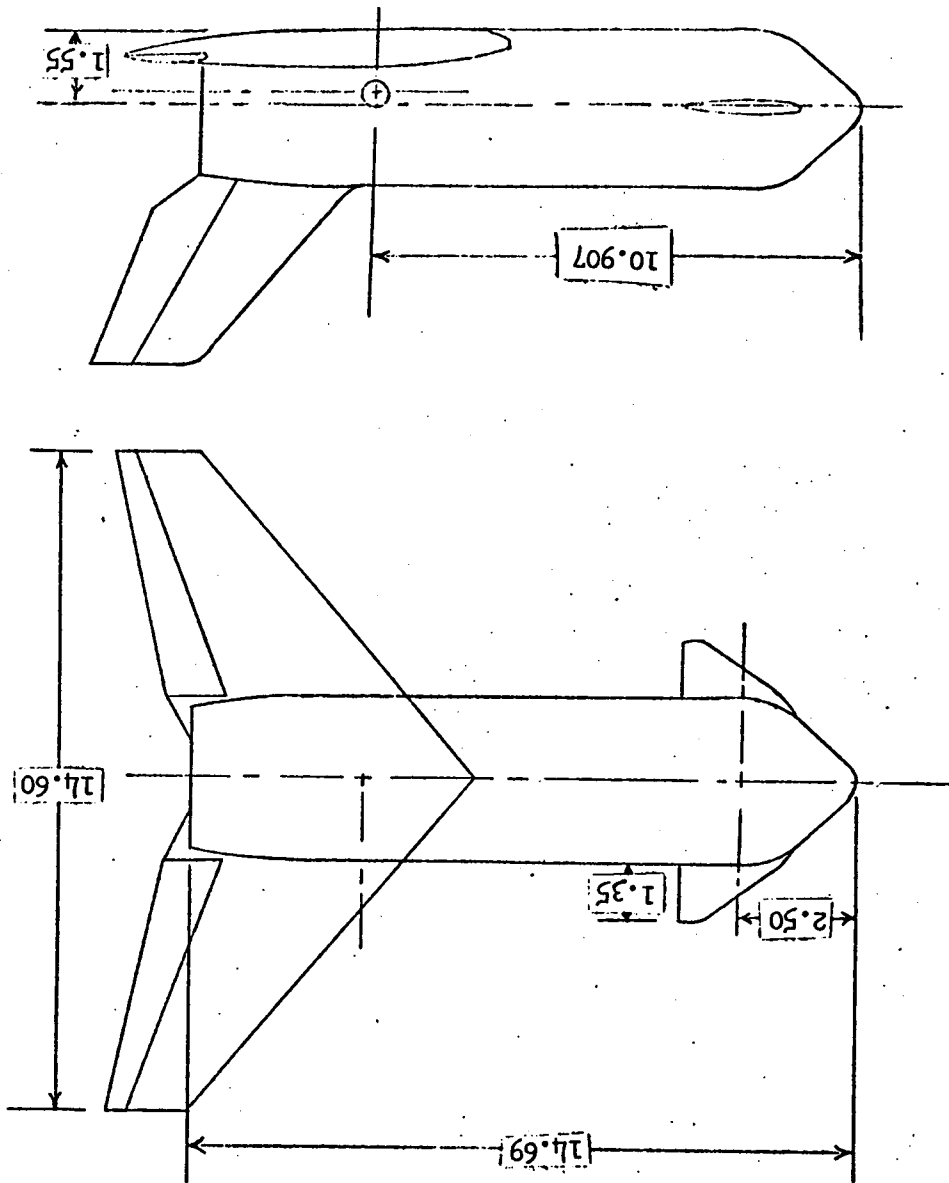
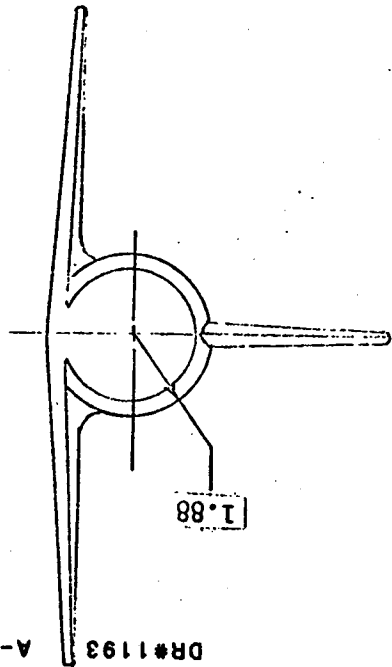


Figure 2. Low Finesse-Retlo Booster  
Dimensions

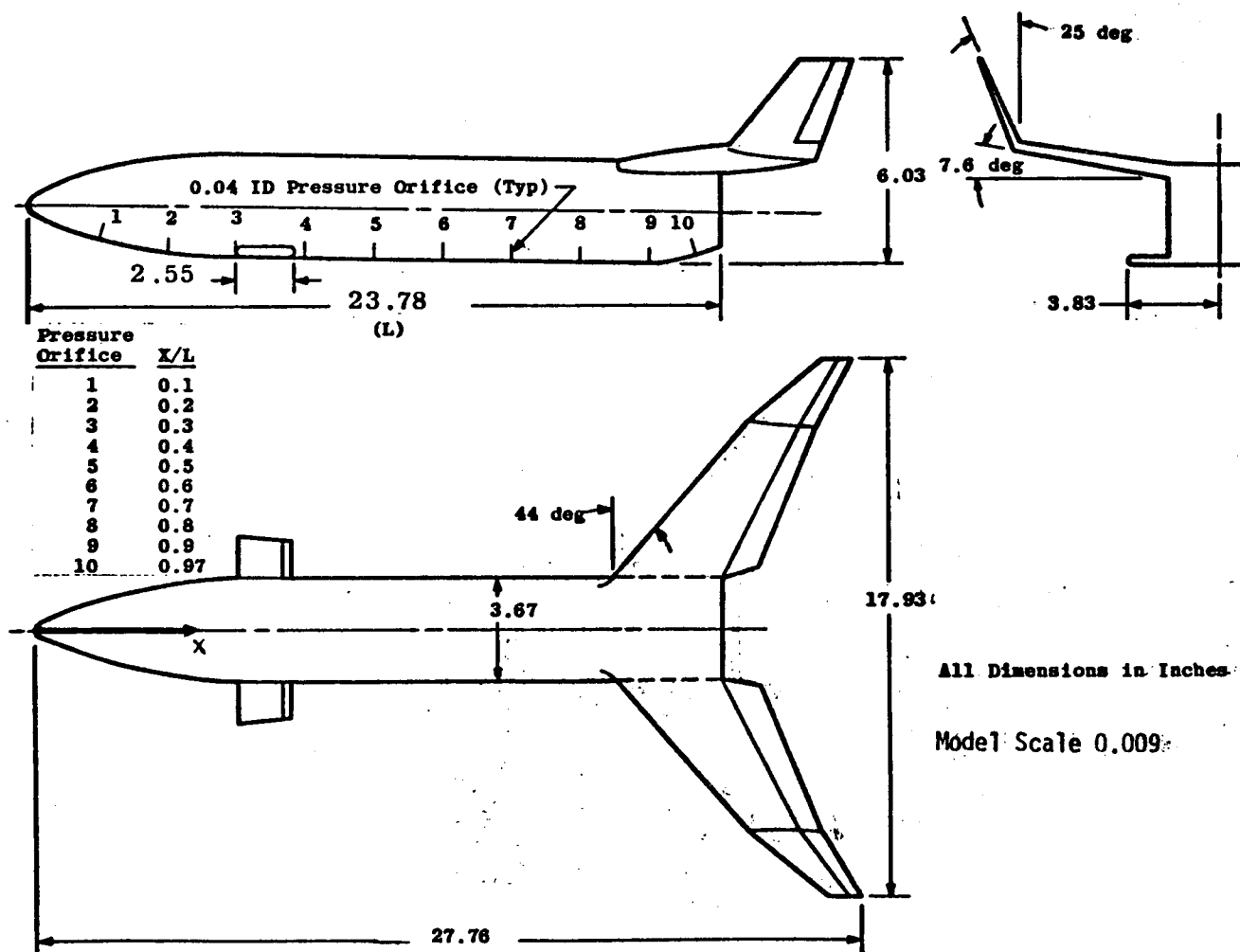
683



UNIQUE CONFIG. BOOSTER  
LARC  
DR#1193  
A-1-590



CANARD BOOSTER  
MDAC  
DR#1225 A-2- 2



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Figure 1. McDonnell-Douglas Booster Model Sketch (0.009 Scale)

Probe Height, Y, in.		
No.	Pressure Probes	Temperature Probes
1	0.014	0.051
2	0.066	0.131
3	0.112	0.202
4	0.163	0.303
5	0.216	0.402
6	0.258	0.599
7	0.313	
8	0.365	
9	0.415	
10	0.499	
11	0.606	
12	0.702	
13	0.802	
14	0.892	
15	0.981	

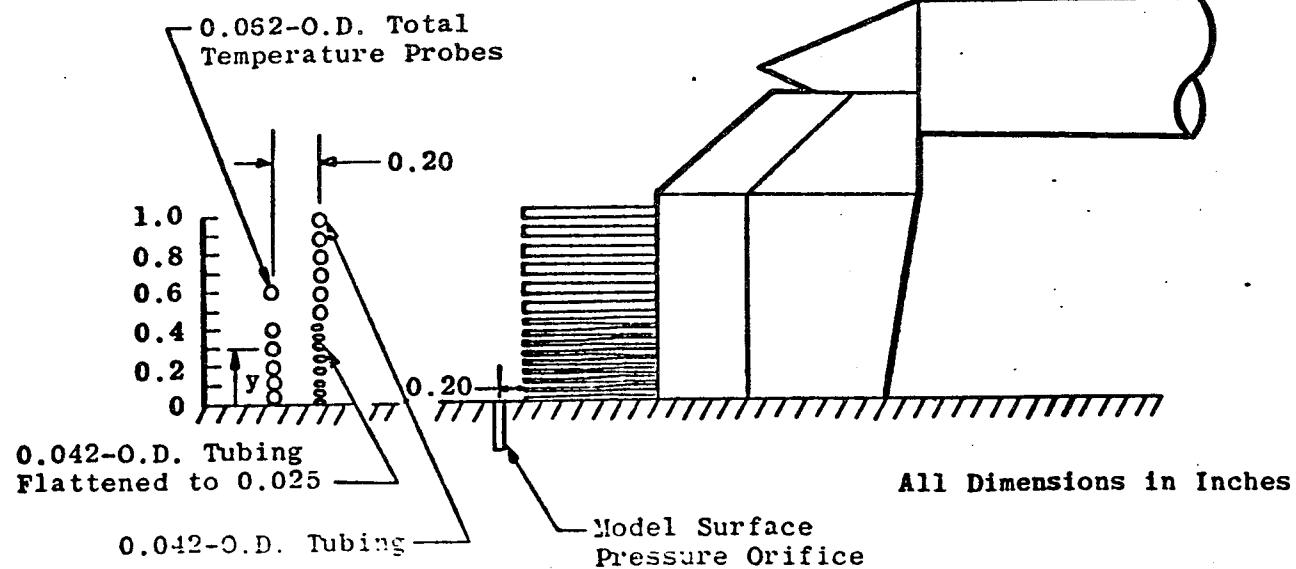
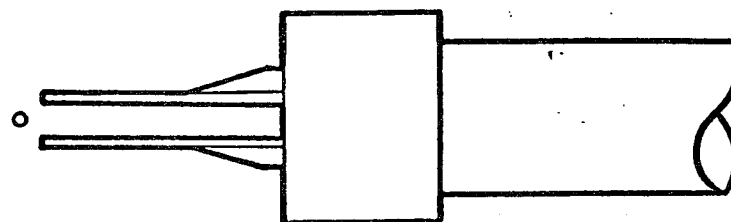


Fig. 3 Probe-Rakes and Support

CANARD BOOSTER  
MDAC  
DR#1225 A-2- 3

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UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1125 A-2-4

TABLE II

INSTRUMENTATION - IDENTIFICATION AND LOCATION

AEDC NO.	CCSD NO.	MODEL STA.	R	$\phi$	X/D	R/D	REMARKS
1	4.722	4.722	12.890	1°0'	.17488	.47740	Chamber Pressure
2	4.722	4.722	12.890	89°0'	.17488	.47740	↓
3	4.306	4.306	12.655	278°37'	.15948	.46870	Aerospike Static
4	4.306	4.306	12.655	318°	.15948	.46870	
5	4.186	4.186	12.550	277°37'	.15503	.46481	
6	4.186	4.186	12.550	317°	.15503	.46481	
7	3.966	3.966	12.400	276°37'	.14688	.45925	
8	3.966	3.966	12.400	316°	.14688	.45925	
9	3.626	3.626	12.180	275°37'	.13429	.45111	
10	3.626	3.626	12.180	315°	.13429	.45111	
11	3.366	3.366	12.035	274°37'	.12466	.44574	
12	3.366	3.366	12.035	314°	.12466	.44574	
13	3.096	3.096	11.900	273°37'	.11466	.44074	
14	3.096	3.096	11.900	313°	.11466	.44074	
15	2.826	2.826	11.775	272°37'	.10466	.43611	
16	2.826	2.826	11.775	312°	.10466	.43611	
17	2.313	2.313	11.555	271°37'	.08566	.42796	
18	2.313	2.313	11.555	311°	.08566	.42796	↓
19	2.429	2.429	11.000	351°	.08996	.40740	Turbine Ex. Pressure
20	2.429	2.429	11.000	171°	.08996	.40740	↓
21	2.218	2.218	11.455	269°	.08214	.42455	Base Static
22	2.218	2.218	11.455	309°	.08214	.42455	
23	1.723	1.723	10.250	5°37'	.06381	.37962	
24	1.474	1.474	9.500	5°37'	.05459	.37186	

TABLE II (Continued)

AEDC NO.	CCSD NO.	MODEL STA.	R	$\phi$	X/D	R/D	REMARKS
25	1.246	8.750	5°37'		.04614	.32407	Base Static
26	.973	7.750			.03603	.28703	
27	.735	6.750			.02722	.25000	
28	.443	5.250			.01640	.19444	
29	.225	3.750			.00833	.13888	
30	.080	2.250			.00296	.08333	
31	0	-	-	-	-	-	
32	1.723	10.250	45°0'		.06381	.37962	
33	1.246	8.750			.04614	.32407	
34	.735	6.750			.02722	.25000	
35	.225	3.750			.00833	.13888	
36	1.723	10.250	90°0'		.06381	.37962	
37	1.474	9.500			.05459	.35185	
38	1.246	8.750			.04614	.32407	
39	.973	7.750			.03603	.28703	
40	.735	6.750			.02722	.25000	
41	.443	5.250			.01640	.19444	
42	.225	3.750			.00833	.13888	
43	.080	2.250			.00296	.08333	
44	1.723	10.250	135°		.06381	.37962	
45	1.246	8.750			.04614	.32407	
46	.735	6.750			.02722	.25000	
47	.225	3.750			.00833	.13888	
48	1.723	10.250	174°23'		.06381	.37962	

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UNIQUE CONFIGS. BOOSTER  
CCSD

DR#1125 A-2-6

TABLE II (Continued)

AEDC NO.	CCSD NO.	MODEL STA.	R	$\phi$	X/D	R/D	REMARKS
49	1.474	9.500	174°23'	.05459	.35185	Base Static	
50	1.246	8.750		.04614	.32407		
51	.973	7.750		.03603	.28703		
52	.735	6.750		.02722	.25000		
53	.443	5.250		.01640	.19444		
54	.225	3.750		.00833	.13888		
55	.080	2.250		.00296	.08333		
56	19.891	3.667		.73670	.13581	45° Cone Static	
57	18.891	4.667		.69966	.17285		
58	17.891	5.667		.66263	.20989		
59	16.891	6.667		.62559	.24693		
60	15.891	7.667		.58855	.28396		
61	14.891	8.667		.55152	.32099		
62	14.241	9.317		.52744	.34507		
63	13.641	9.789		.50522	.36256	25° Cone Static	
64	12.641	10.255		.46818	.37981		
65	11.641	10.721		.43115	.39707		
66	10.641	11.187		.39411	.41433		
67	9.641	11.654		.35707	.43163		
68	8.641	12.120		.32004	.44889		
69	7.641	12.586		.28299	.46615		
70	7.041	12.866		.26078	.47652		
71	19.891	3.667	180°	.73670	.13581	Cone Static	
72	18.891	4.667		.69967	.17285		

TABLE II (Continued)

AEDC NO.	CCSD NO.	MODEL STA.	R	$\phi$	X/D	R/D	REMARKS
73	17.891	5.667	180°	.66263	.20289	45° Cone Static	
74	16.891	6.667		.62559	.24693		
75	15.891	7.667		.58855	.28396		
76	14.891	8.667		.55152	.32099		
77	14.241	9.317		.52744	.34507		
78	13.641	9.789		.50522	.36256	25° Cone Static	
79	12.641	10.255		.46818	.37981		
80	11.641	10.721		.43115	.39707		
81	10.641	11.187		.39411	.41433		
82	9.641	11.654		.35707	.43163		
83	8.641	12.120		.32004	.44889		
84	7.641	12.586		.28299	.46615		
85	7.041	12.866		.26078	.47652		
86	14.891	8.667	20°	.55152	.32099	45° Cone Static	
87			40°				
88			60°				
89			80°				
90			100°				
91			120°				
92			140°				
93			160°				
94	7.041	12.866	20°	.26078	.47652	25° Cone Static	
95			40°				
96			60°				



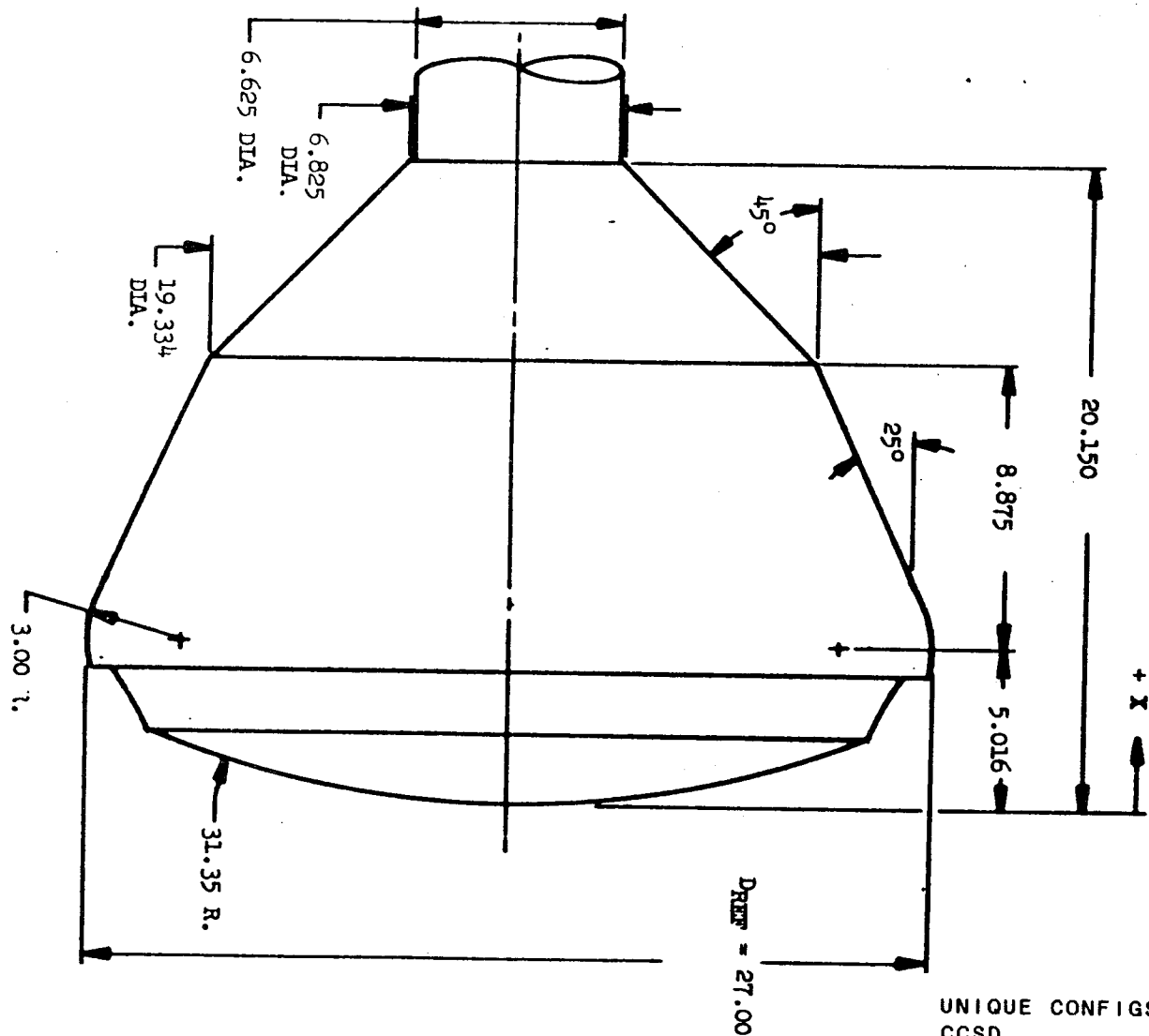
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UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1125

A-2-8

TABLE II. (Continued)

AEDC NO.	CCSD NO.	MODEL STA.	R	$\phi$	X/D	R/D	REMARKS
97		7.041	12.866	79°	.26078	.47652	25° Cone
98		↓	↓	101°	↓	↓	↓
99				120°			
100				140°			
101		↓	↓	160°	↓	↓	↓
102	4.380	12.968	263°45'	.16222	.48029	Shroud Static	
103	4.203	13.071	265°	.15566	.48411		
104	4.116	13.220	267°30'	.15244	.48962		
105	4.116	13.400	268°45'	.15244	.49629		
106	4.380	12.968	305°	.16222	.48029		
107	4.203	13.071	306°15'	.15566	.48411		
108	4.116	13.220	308°45'	.15224	.48962		
109	4.116	13.400	310°	.15224	.49629		↓



UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1125 A-2- 9

Figure 2. MODEL GEOMETRY

FIG. 5

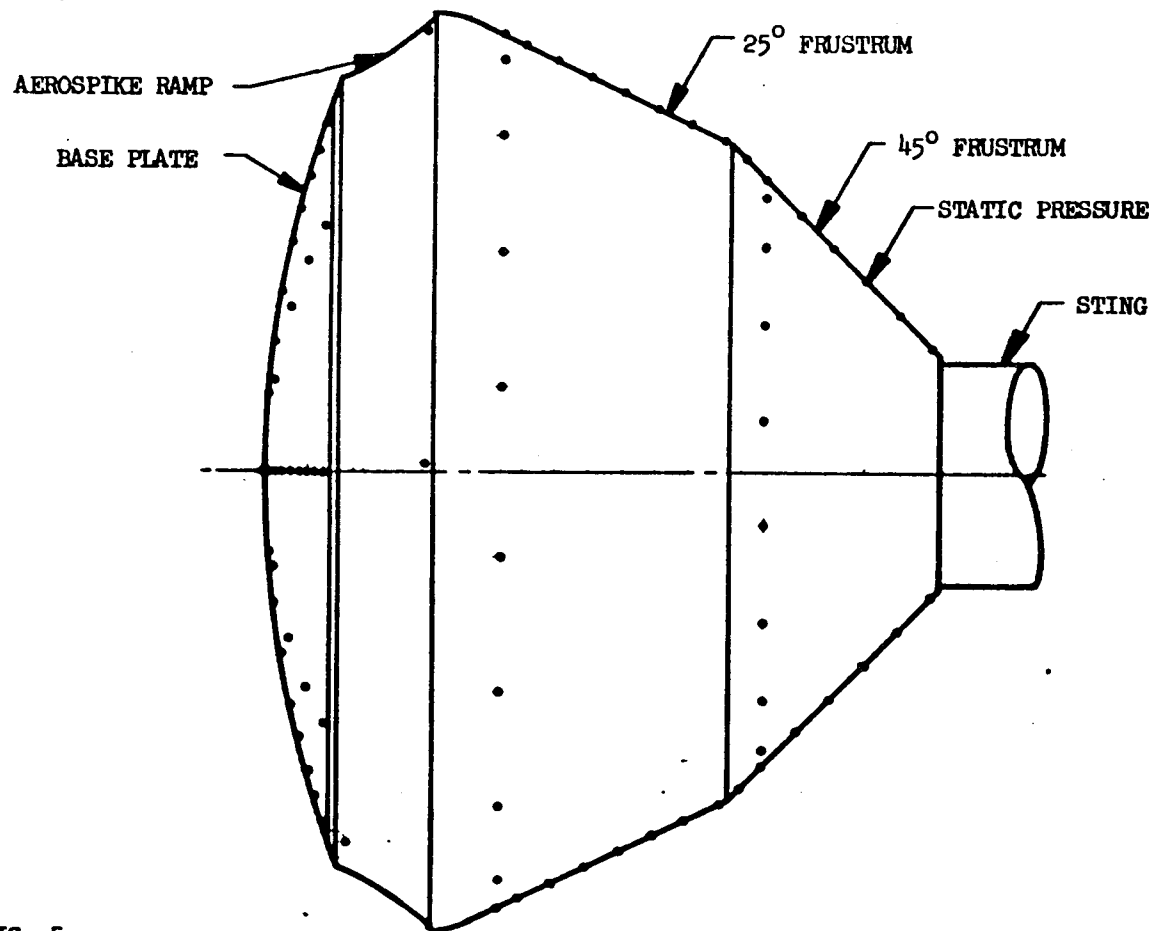


FIG. 5

FIG. 4

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Figure 3. MODEL INSTRUMENTATION

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UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1125 A-2- 11

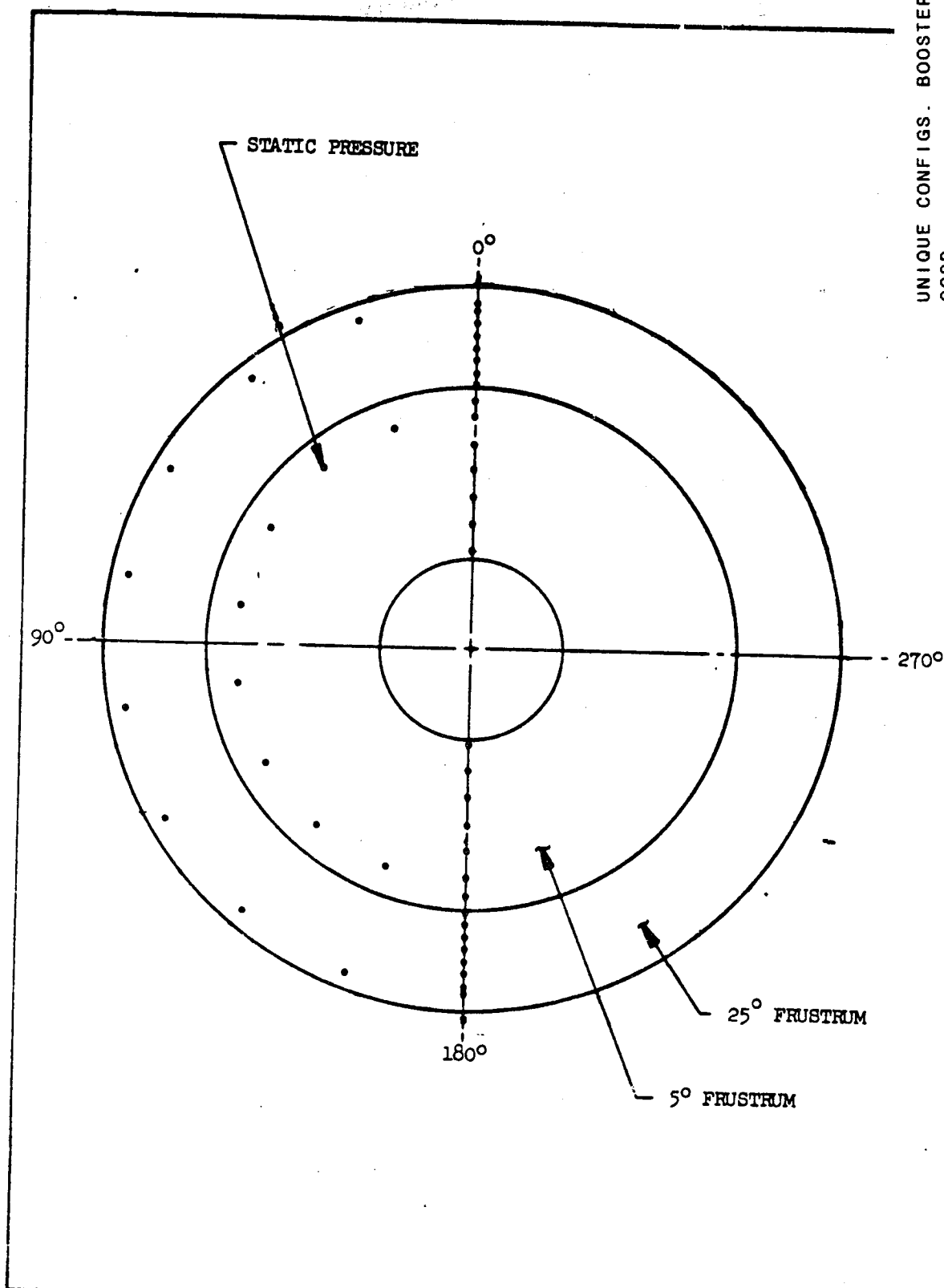


Figure 4. FOREBODY INSTRUMENTATION

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1125 A-2- 12

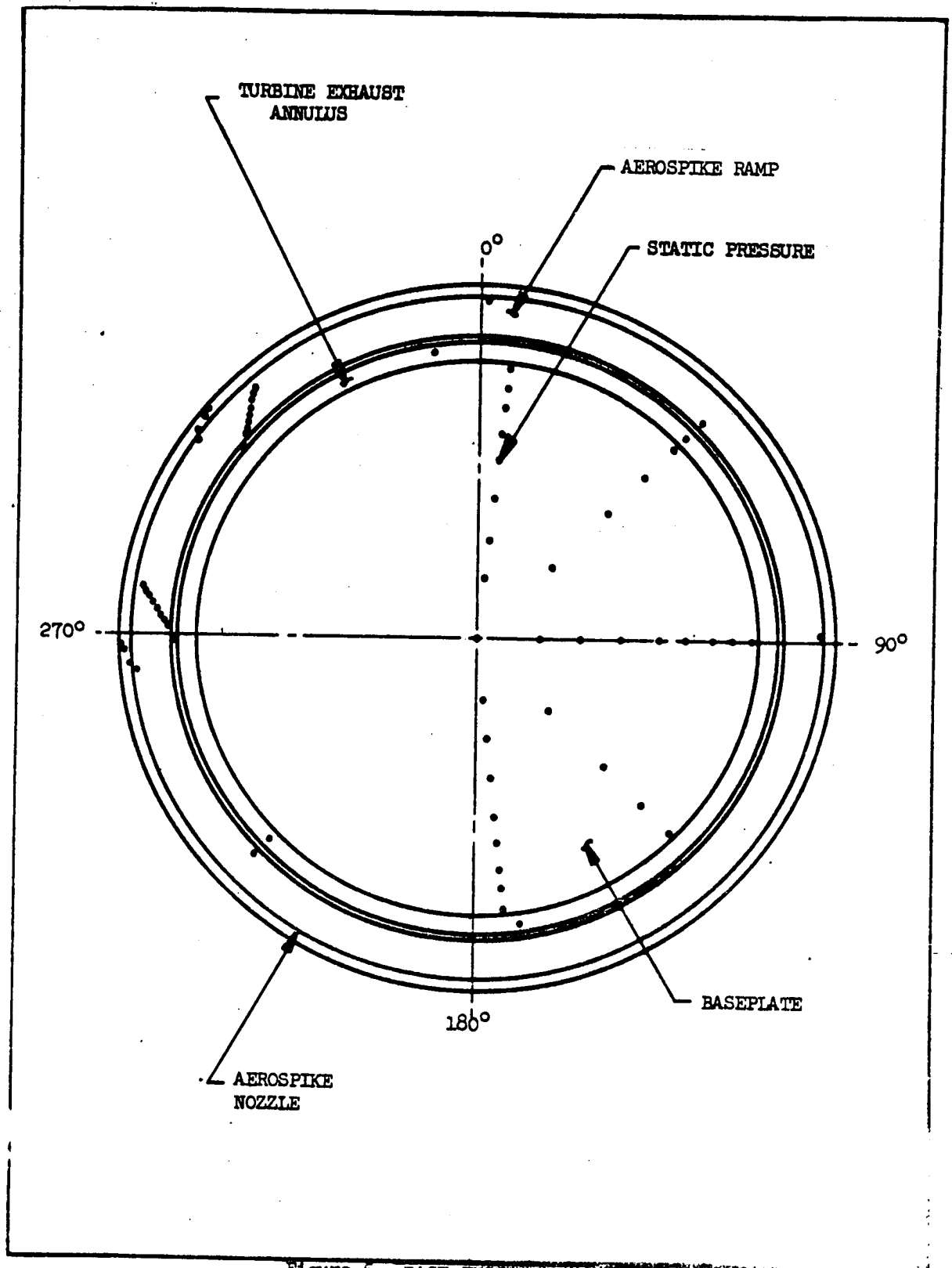


Figure 5. BASE INSTRUMENTATION

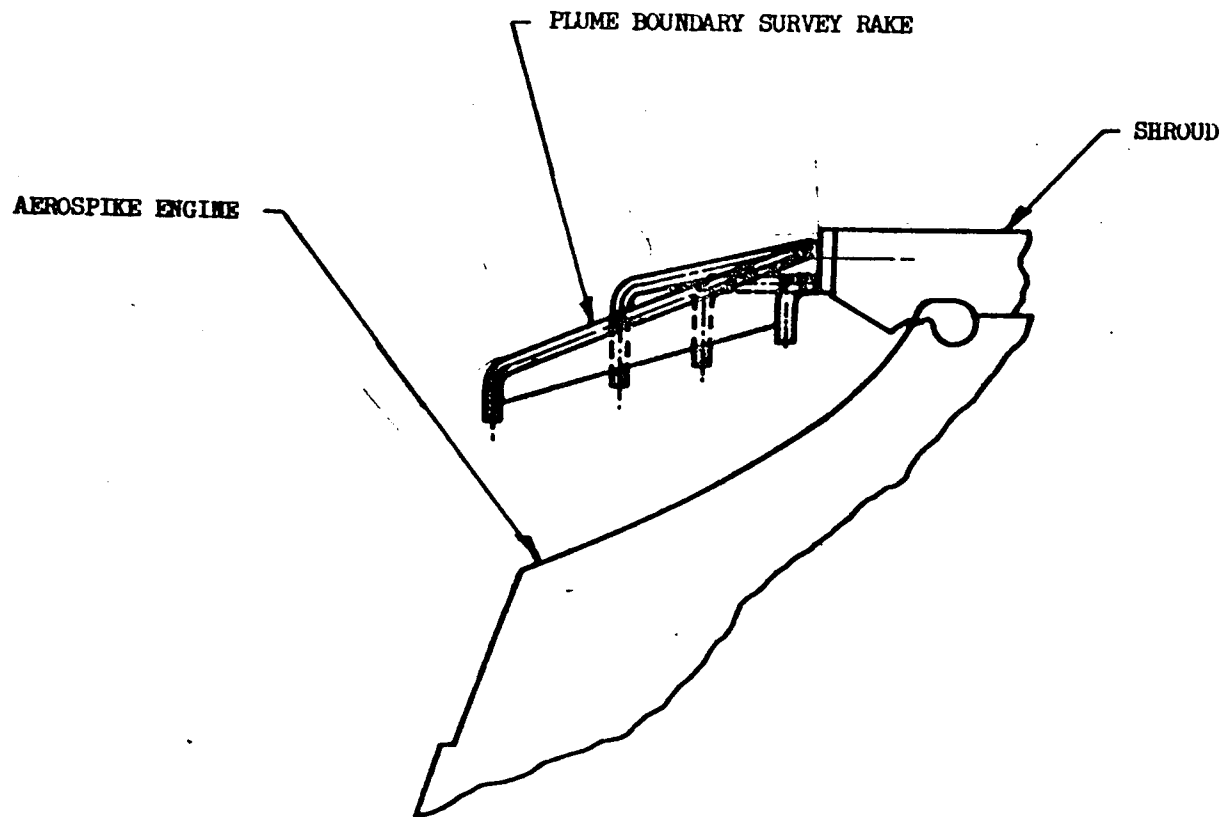


Figure 6. INSTALLATION OF PLUME BOUNDARY SURVEY RAKE

UNIQUE CONFIGS. BOOSTER  
CCSD  
DR#1125 A-2- 13

Table 3  
PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Reentry Heat Transfer Test of MDAC-Booster

TEST NUMBER: VT1162-12

TEST FACILITY: VKF Tunnel B

TEST DATE: June & Sept. 1971

TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	$\frac{T_{aw}}{T_{total}}$	$\frac{RNX10^6}{Ft}$	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									$\alpha$	$\beta$	$\phi$	
361	MDAC-B (No Trips)	0.009	8.0	555	1310	1.0	2.5	150	40	0	180	Bottom
357								300	50			
359								300	60			
88	MDAC-B (No Trips)	0.009	8.0	860	1345	1.0	3.7	300	40	0	180	Bottom
188								350	40			
352								300	40			
85								300	50			
190								400	50			
192								400	60			
379	MDAC-B (Trips) <sup>+</sup>	0.009	8.0	860	1345	1.0	3.7	400	40	0	180	Bottom
382								300	40			
380								350	50			
381								400	60			

\*  $T_{aw}$  = adiabatic wall temperature

<sup>+</sup>Trips on bottom surface only

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TABLE 3 - CONTINUED  
PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Reentry Heat Transfer Test of MDAC-Booster

TEST NUMBER: VT1162-12

TEST FACILITY: VKF Tunnel B

TEST DATE: June & Sept. 1971

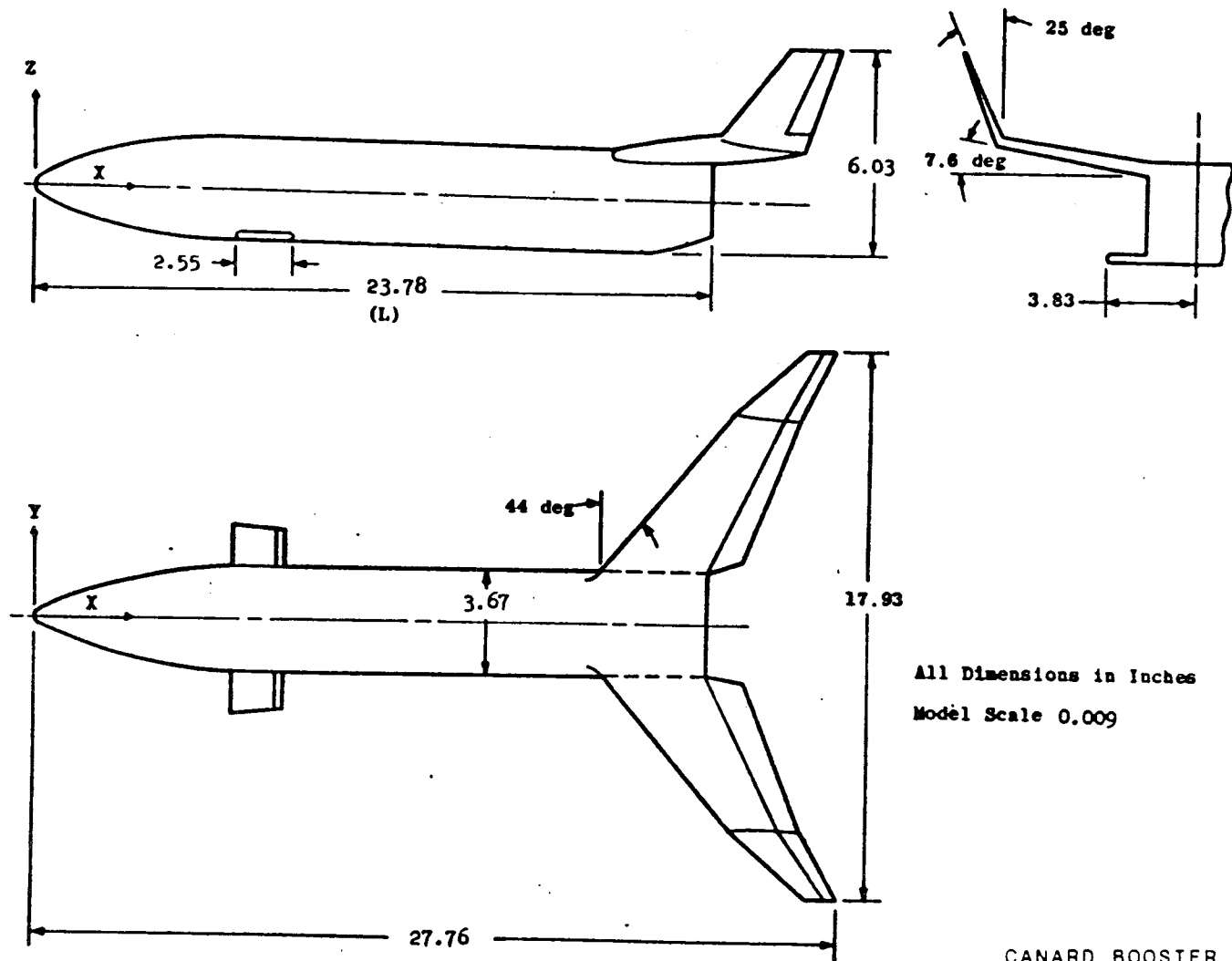
TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T <sub>aw</sub> * T <sub>total</sub>	RNX10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									α	β	φ	
361	MDAC-B (No Trips)	0.009	8.0	555	1310	1.0	2.5	150	40	0	180	Side
359	↓	↓	↓	↓	↓	↓	↓	300	60	↓	↓	↓
84	MDAC-B (No Trips)	0.009	8.0	860	1345	1.0	3.7	250	40	0	180	Side
188	↓	↓	↓	↓	↓	↓	↓	350	40	↓	↓	↓
85	↓	↓	↓	↓	↓	↓	↓	300	50	↓	↓	↓
190	↓	↓	↓	↓	↓	↓	↓	400	50	↓	↓	↓
192	↓	↓	↓	↓	↓	↓	↓	400	60	↓	↓	↓
379	MDAC-B (Trips) <sup>†</sup>	0.009	8.0	860	1345	1.0	3.7	400	40	0	180	Side
382	↓	↓	↓	↓	↓	↓	↓	300	40	↓	↓	↓
380	↓	↓	↓	↓	↓	↓	↓	350	50	↓	↓	↓
381	↓	↓	↓	↓	↓	↓	↓	400	60	↓	↓	↓

\* T<sub>aw</sub> = adiabatic wall temperature

† Trips on bottom surface only





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Figure 1. McDonnell-Douglas Booster Model Sketch (0.009 Scale)

CANARD BOOSTER  
MDAC  
DR#1207 A-3- 3

TABLE II. PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC BOOSTER THERMAL MAPPING TEST

TEST NUMBER: TEST FACILITY: LRC Mach 8 VDT

TEST DATE: April 27, 1971 TEST ENGINEER: Schmitt

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	$\frac{T_{aw}}{T_{total}}$	RNX10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									$\alpha$	$\beta$	$\phi$	X	Y	Z
1204	B3	.00325	7.91	515	1390	0.95	2.31	450	60	0	180			
1205	B3		7.91	515	1335		2.47	275	60	0	180			
1206	B3		7.91	515	1340		2.46	550	60	0	180			
1207	B3 (See Note 1)		8.05	1490	1405		6.00	550	60	0	180			
1208	B3		7.91	515	1275		2.66	125	60	0	180			
1209	B1		7.91	515	1335		2.47	500	60	0	180			
1210	B1		7.91	515	1330		2.49	350	60	0	180			
1211	B3		7.79	215	1245		1.20	275	45	0	180			
1212	B3		7.79	215	1275		1.15	400	45	0	180			
1213	B3 (See Note 2)		8.04	1435	1420		5.99	450	45	0	180			

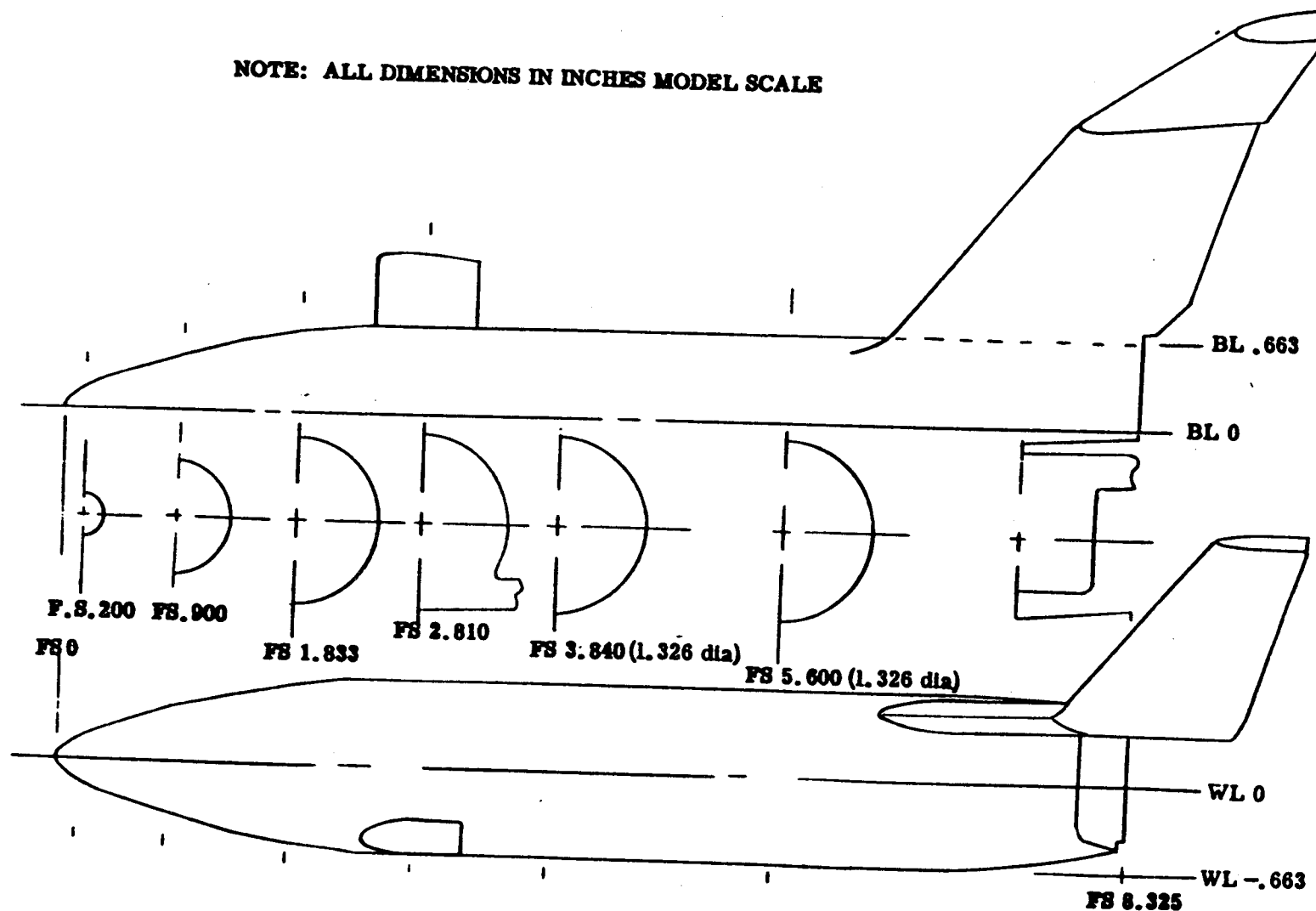
\*\* X axis parallel to stream (+downstream, -upstream)  
Y axis (+right, -left, as viewed from the rear)  
Z axis (+up, -down)

\*  $T_{aw}$  = adiabatic wall temperature

NOTE: 1) Wings broke off model at injection, no data  
2) Wings broke off model 5 sec after injection.

NOTE: ALL DIMENSIONS IN INCHES MODEL SCALE

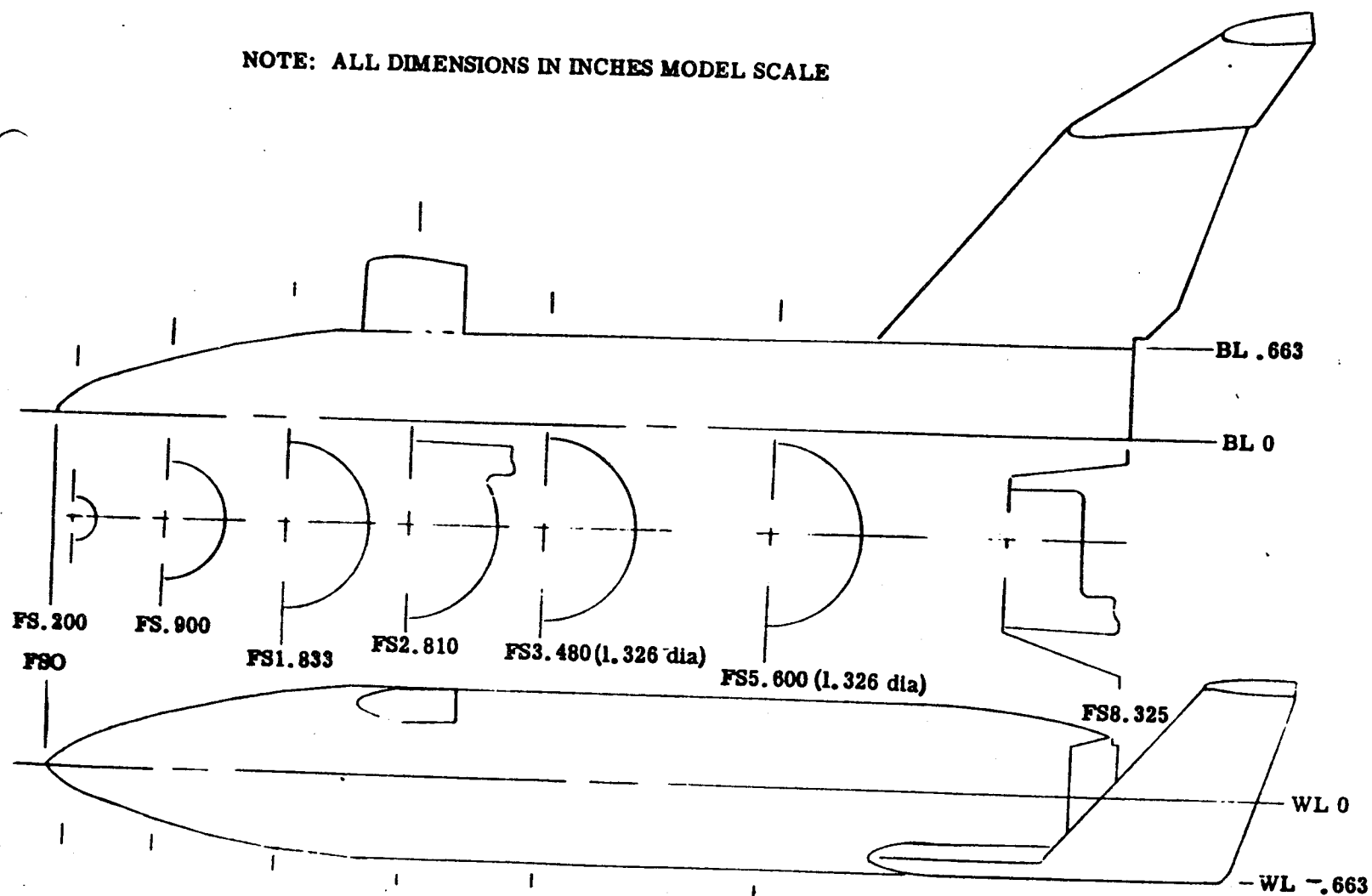
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BASELINE BOOSTER CONFIGURATION (BU)  
FIGURE 1

CANARD BOOSTER  
MDAC/MMC  
DR#1138 A-3- 5

NOTE: ALL DIMENSIONS IN INCHES MODEL SCALE

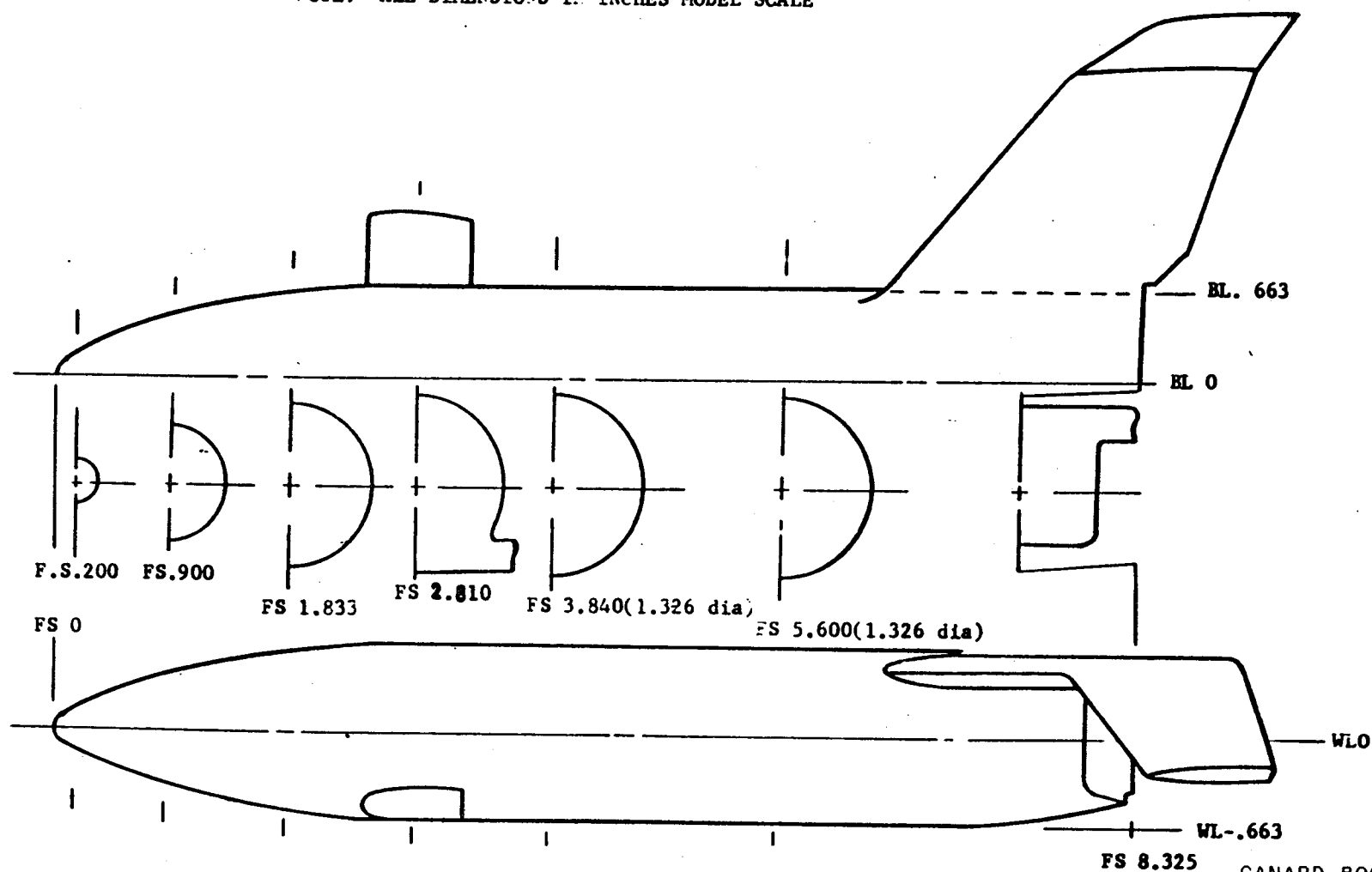


ALTERNATE BOOSTER CONFIGURATION (B2)

FIGURE 2

NOTE: ALL DIMENSIONS IN INCHES MODEL SCALE

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VENTRAL TIP FIN BOOSTER CONFIGURATION (23)

FIGURE 3

CANARD BOOSTER  
MDAC/MMC  
DR#1138 A-3- 7

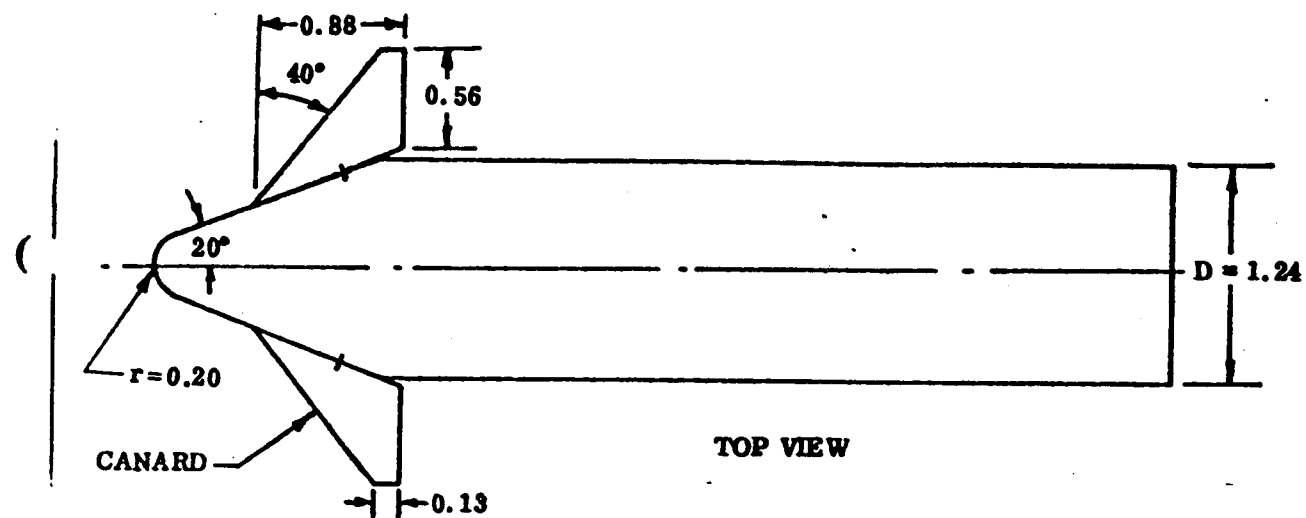
Table 3. Phase Change Paint Test Data Summary

Run No.	Model Configuration*	Free Stream Mach No. M <sub>∞</sub>	Tunnel Total Pressure P <sub>0</sub> (psia)	Tunnel Total Temp. T <sub>0</sub> (°F)	Free Stream Reynolds No. Re <sub>∞</sub> / ft × 10 <sup>6</sup>	Angle of Attack α (Deg.)	Phase Change Temp. T <sub>pc</sub> (°F)	Model Initial Temp. T <sub>i</sub> (°F)	h <sub>ray</sub> <sup>1</sup> Btu/ft <sup>2</sup> -sec-°R	Remarks
488	B	8	210	425		60	125	70		Data not reduced on these runs due to shock reflection from tunnel wall on model. (Runs 489 - 499)
489	C		210	425			125	73		
491	D		200	405			125	70		
492	D		212	405			125	73		
493	B		210	430			175	70		
494	C		207	410			175	71		
495	B		205	420			175	71		
496	B		200	370			175	76		
497	B		1000	450	17.34		225	76	0.2037	
498	C		1005	470	16.88		225	75	0.2047	
499	D		1010	470	16.91		225	76	0.2053	Incomplete model injection.
500	B		1000	485	16.31		300	79	0.2040	
501	C		1000	480	16.45		300	78	0.2000	
502	D		1010	475	16.70		300	77	0.2048	
503	B		400	445	6.75		225	81	0.1291	
504	C		400	445	6.75		225	79	0.1291	
505	D		400	445	6.75		225	74	0.1291	
506	B		1910	510	25.88		400	74	0.2315	
507	C		1840	515	25.55		400	76	0.2785	
508	D		1800	520			400	75		
509	A		1010	490	15.34		225	76	0.2055	
510	B		1810	510	25.32		300	76	0.2754	
511	A		955	505	15.54		400	82	0.2023	
512	C		1725	525	25.90		300	76	0.2596	
513	A		1600	510	25.05		400	85	0.2549	
514	A		1800	510	25.41	40	400	75	0.2796	
515	B		1915	510	30.20		400	75	0.2350	
516	C		1910	490	30.89		400	75	0.2311	
517	A		1800	520	15.25		300	75	0.2049	
518	B		1000	510	15.04		300	75	0.2046	
519	C		1000	490	15.17		300	75	0.2041	
520	D		1000	525	15.26		300	75	0.2050	
521	B		400	445	6.75		225	76	0.1290	
522	D		1900	525	25.61		400	81	0.2797	
523	C		400	470	6.60		225	75	0.1291	
524	D		400	490	6.55		225	81	0.1293	
525	D		1875	520	25.85	60	440	81	0.2798	
526	B		950	495	15.88	20	225	73	0.2038	
527	C		1010	515	15.67	20	225	75	0.2054	
528	A		1000	515	15.51	20	225	76	0.2054	
529	D		955	510	15.56	20	225	73	0.2047	
530	A		955	510	15.56	0	225	76	0.2047	
531	A		1005	520	15.45	0	175	50	0.2004	

- \*A Nose and fuselage of BSV configuration with conical.  
 B Nose profile of BSV with cylindrical fuselage.  
 C Nose profile of BSV with semicylindrical-semielliptical fuselage.  
 D Nose profile of BSV with semicylindrical-semi-rectangular fuselage.

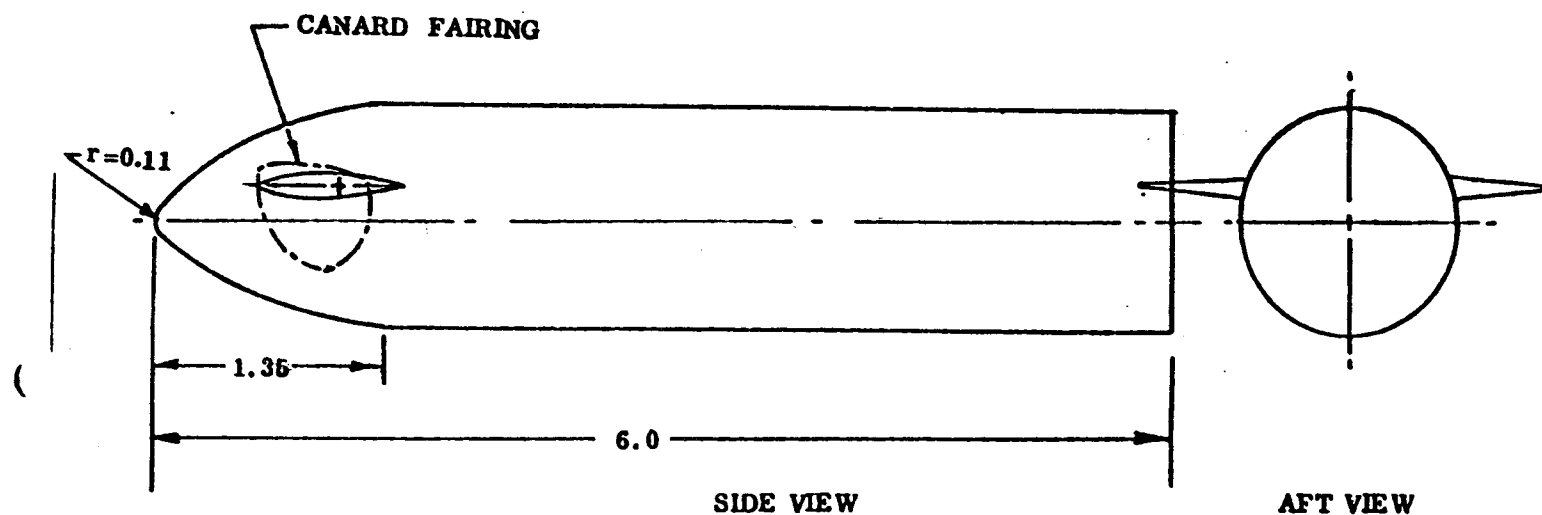
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TOP VIEW

ALL DIMENSIONS IN INCHES

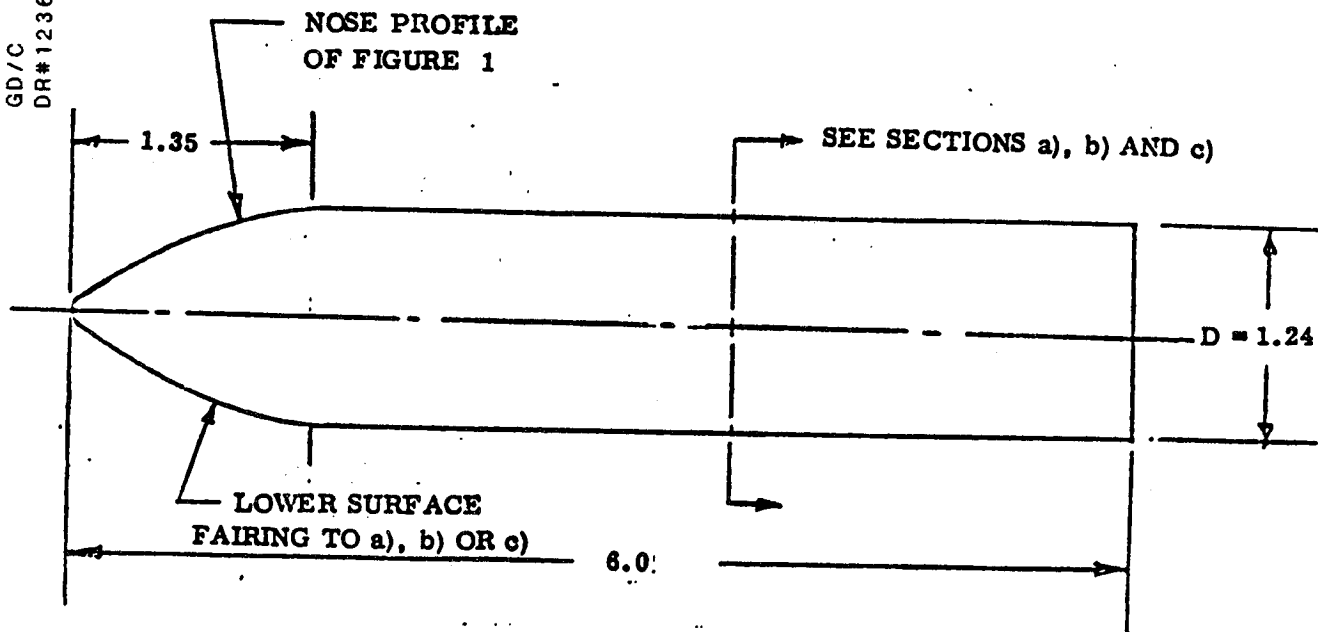


SIDE VIEW

AFT VIEW

Figure 1. Model Configuration A

CYLINDRICAL BOOSTER  
GD/C  
DR#1236 A-3- 9



ALL DIMENSIONS IN INCHES.

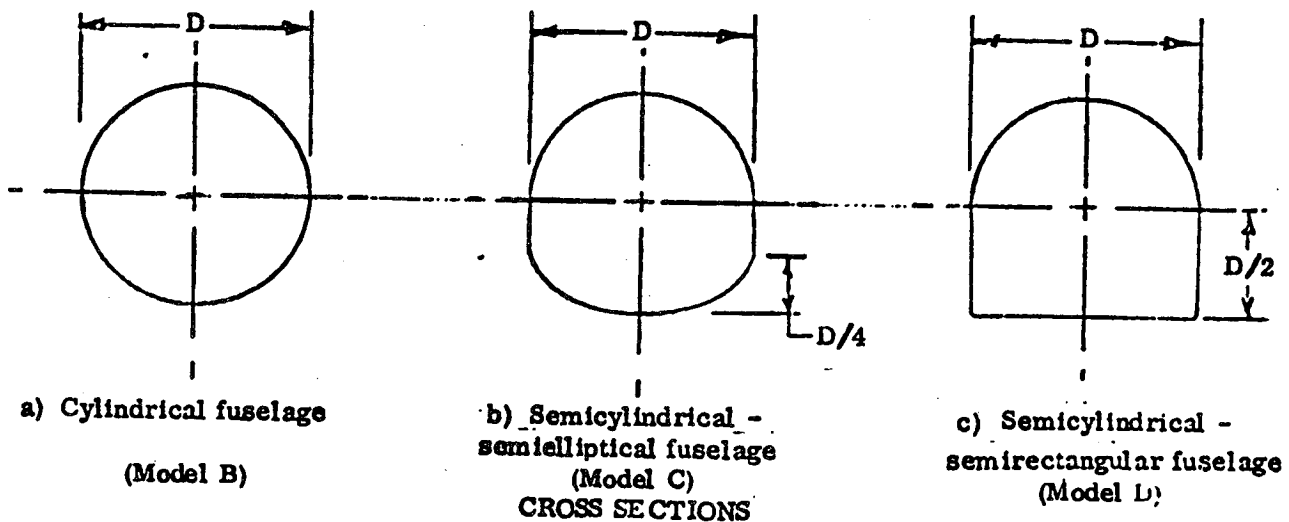


Figure 2. Models Configuration B, C and D



# PHASE CHANGE COATING TEST DATA SUMMARY SHEET

Table 1.

TEST TITLE: Space Shuttle Booster Heat Transfer Model Test

TEST NUMBER: 52 TEST FACILITY: NASA/LRC 31-Inch-CFHT

TEST DATE: 6 Aug. thru 14 Aug. 1970 TEST ENGINEER: A. Roberge

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (*R)	$T_{aw}^*$ $T_{total}$	RNK10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi$	X	Y	Z
1	B11	.0035	10.37	850	1820	.9	1.053	131	0	0	0			
2	B12		10.37				1.053	113	10	0				
3	B11		10.37				1.053	113	0	0				
4	B12		10.37				1.053	113	10	0				
5	B11		10.37				1.053	113	0	0				
6	B12		10.37				1.053	113	10	0				
7	B11		10.37				1.053	113	0	5				
8	B12							125	20	0				
9	B12							150	20	0				
10	B11							113	0	5				
11	B2							113	0	0				
12	B12							125	20	0				
13	B11	↓	↓	↓	↓	↓	↓	200	30	0	↓			

\*\* X axis parallel to stream (+ downstream, - upstream)  
Y axis (+ right, - left, as viewed from the rear)  
Z axis (+ up, - down)

\*  $T_{aw}$  = adiabatic wall temperature

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DELTA WING BOOSTER  
GD/C  
DR#1020 A-3- 11

PHASE CHANGE COATING TEST DATA SUMMARY SHEET  
Table 2.

TEST TITLE: Space Shuttle Booster Heat Transfer Model Tests  
TEST NUMBER: 52 TEST FACILITY: NASA/LRC 31-Inch CFHT  
TEST DATE: 6 Aug. thru 14 Aug. 1970 TEST ENGINEER: A. Roberge

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	$T_{aw}^*$ $T_{total}$	RNX10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi$	X	Y	Z
14	B12	.0035	10.37	850	1810	.9	1.064	200	20	0	0			
15	B2							113	0	0				
16	B12							125	20	0				
17	B11				1800		1.074	300	30	0				
18	B2				1810		1.064	125	0	0				
19	B2				1790		1.085	150	0	0				
20	B2				1790		1.085	150	0	5				
21	B2				1780		1.096	150	0	5				
22	B2				1760		1.118	150	0	0				
23	B2				1810		1.064	113	10	0				
24	B11				1780		1.096	125	30	0				
25	B2 (Aborted)				1835		"	150	10	0				
26	B2				1810		1.064	125	10	0				

\*\* X axis parallel to stream (+ downstream, - upstream)  
Y axis (+ right, - left, as viewed from the rear)  
Z axis (+ up, - down)

\*  $T_{aw}$  = adiabatic wall temperature

PHASE CHANGE COATING TEST DATA SUMMARY SHEET  
Table 3.

TEST TITLE: Space Shuttle Booster Heat Transfer Model Tests  
TEST NUMBER: 52 TEST FACILITY: NASA/LRC 31-Inch CFHT  
TEST DATE: 6 Aug. thru 14 Aug. 1970 TEST ENGINEER: A. Roberge/W. R. Ginsky

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T <sub>aw</sub> * T <sub>total</sub>	RNX10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi$	X	Y	Z
27	B12	.0035	10.37	850	1820	.9	1.053	125	30	0	0			
28	B2				1810		1.064	125	10					
29	B2				1810		1.064	125	20					
30	B2				1820		1.053	250	20					
31	B11				1810		1.064	200	60					
32	B2				1810		1.064	350	60					
33	B11				1810		1.064	500	60					
34	B2				1850		1.023	500	60					
35	B12				1820		1.053	150	60					
36	B11				1850		1.023	150	60					
37	B11				1820		1.053	200	60					
38	B2				1810		1.064	150	60					
39	B2	✓	✓	✓	1810	✓	1.064	200	60	✓	✓			

\*\* X axis parallel to stream (+ downstream, - upstream)  
Y axis (+ right, - left, as viewed from the rear)  
Z axis (+ up, - down)

\* T<sub>aw</sub> = adiabatic wall temperature

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DELTA WING BOOSTER  
GD/C  
DR#1020 A-3- 13

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

Table 4.

TEST TITLE: Space Shuttle Booster Heat Transfer Model Tests

TEST NUMBER: 52 TEST FACILITY: NASA/LRC 31-Inch CFHT

TEST DATE: 6 Aug. thru 14 Aug. 1970 TEST ENGINEER: W. R. Ginsky

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T <sub>aw</sub> * T <sub>total</sub>	RNX10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi$	X	Y	Z
40	B11	.0035	10.37	850	1810	.9	1.064	300	50	0				
41	B2				1800		1.074	300	50					
42	B11				1830		1.043	500	50					
43	B2				1810		1.064	500	50					
44	B11				1840		1.033	200	40					
45	B2				1840		1.033	200	40					
46	B11				1840		1.033	350	40					
47	B2				1830		1.043	350	40					
48	B2				1840		1.033	200	30					
49	B2				1810		1.064	325	30					
50	B2				1810		1.064	125	30					
51	B2	↓	↓	↓	1830	↓	1.043	200	30	↓				
52	B2 (Aborted)							150	30					

\*\* X axis parallel to stream (+ downstream, - upstream)  
Y axis (+ right, - left, as viewed from the rear)  
Z axis (+ up, - down)

\* T<sub>aw</sub> = adiabatic wall temperature

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# PHASE CHANGE COATING TEST DATA SUMMARY SHEET

Table 5.

TEST TITLE: Space Shuttle Booster Heat Transfer Model Tests

TEST NUMBER: 52 TEST FACILITY: NASA/LRC 31-Inch CFHT

TEST DATE: 6 Aug. thru 14 Aug. 1970 TEST ENGINEER: W. R. Ginsky

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (*R)	$\frac{T_{aw*}}{T_{total}}$	$\frac{RNx10^6}{Ft}$	Phase Change Temp. (*F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi$	X	Y	Z
53	B11	.0035	10.37	850	1780	.9	1.096	150	0	0	0			
54	B2	"	"	"	1850	"	1.023	113	30	0	0			

\*\* X axis parallel to stream (+ downstream, - upstream)  
Y axis (+ right, - left, as viewed from the rear)  
Z axis (+ up, - down)

\*  $T_{aw}$  = adiabatic wall temperature

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DELTA WING BOOSTER  
GD/C  
DR#1020 A-3- 15

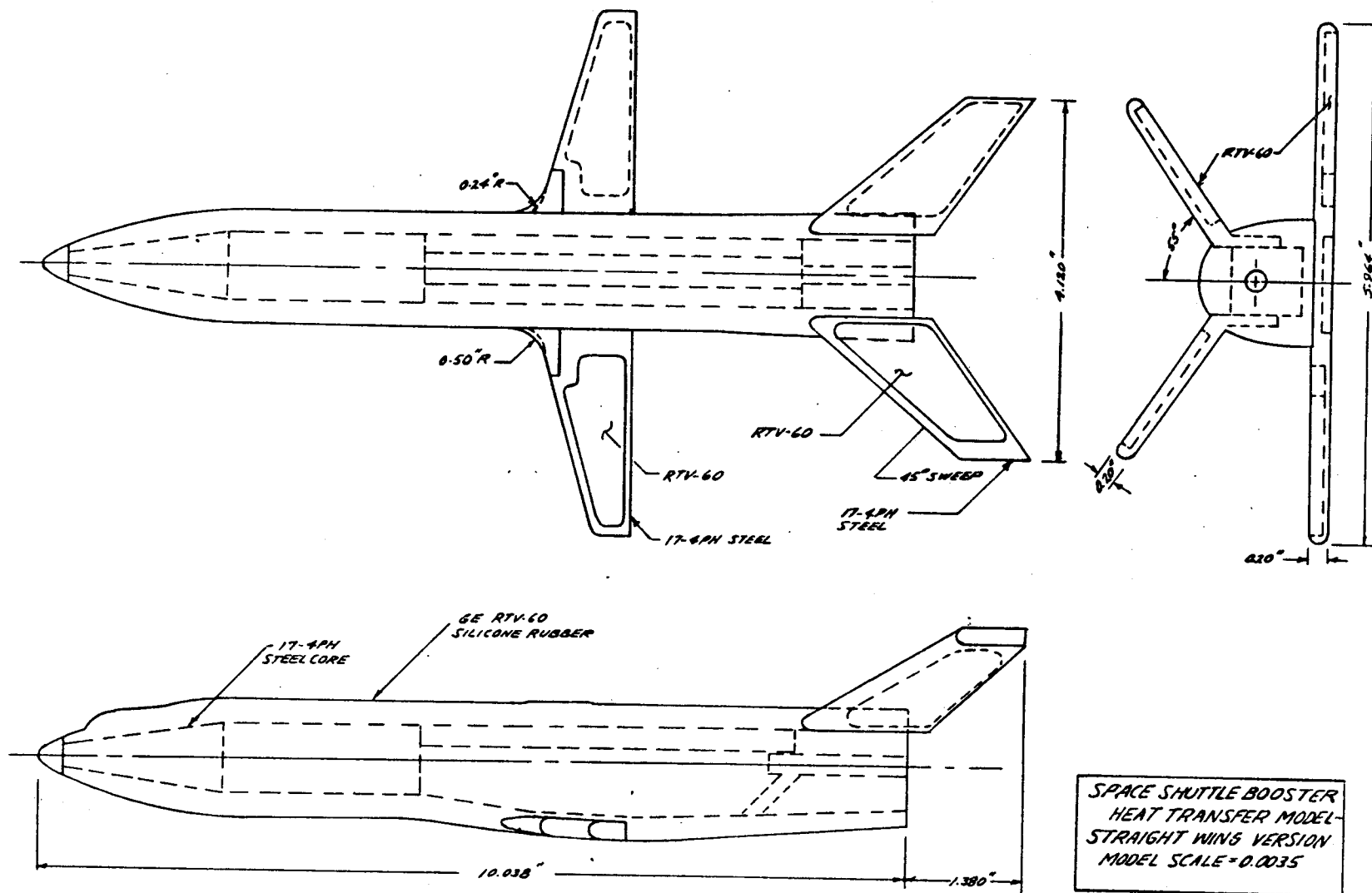


Figure 1.

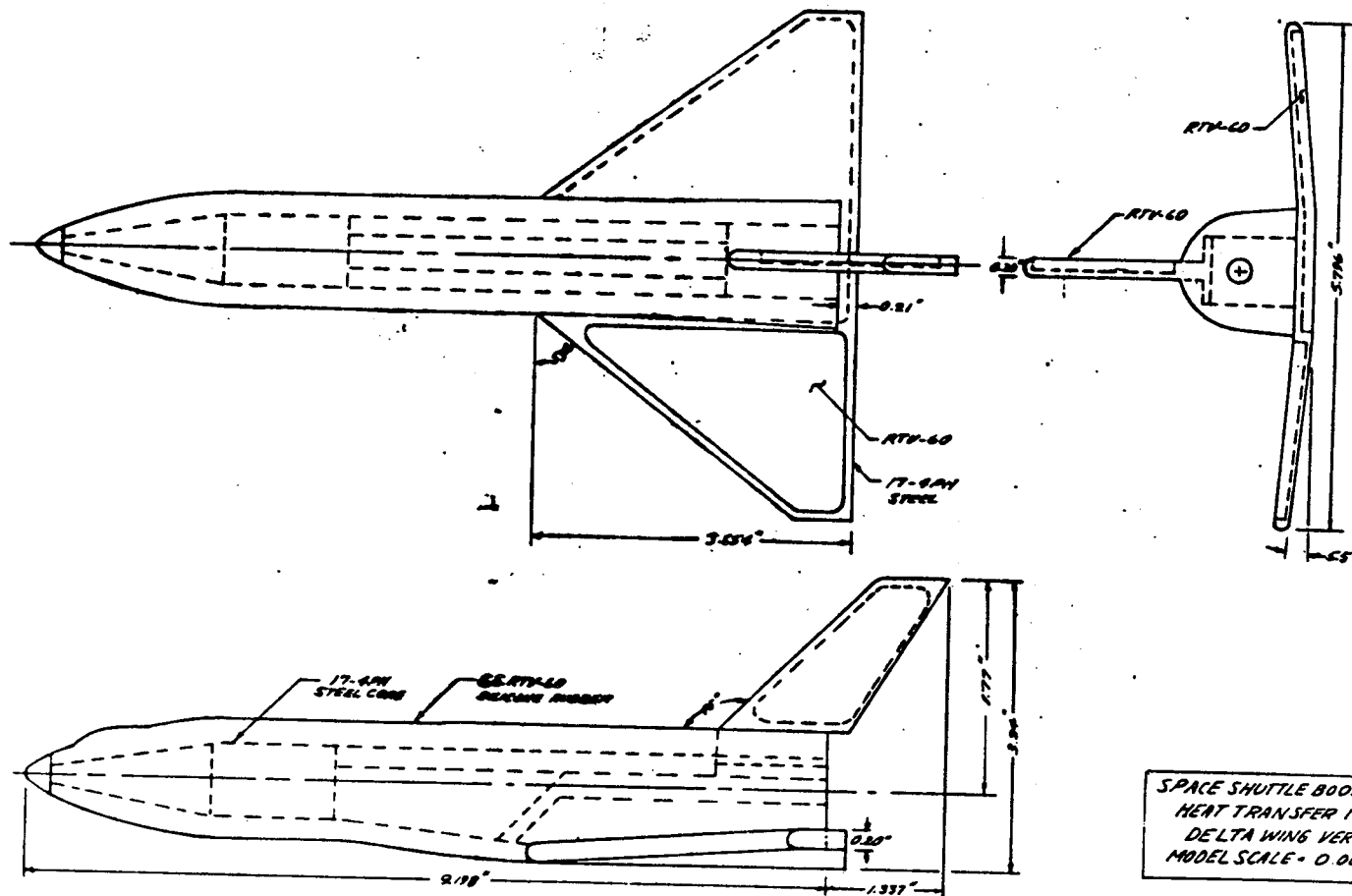


Figure 2.

DELTA WING BOOSTER  
GD/C  
DR#1020 A-3- 17

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**PHASE CHANGE COATING TEST DATA SUMMARY SHEET**  
Table 1.

DELTA WING BOOSTER  
GD/C  
DR#1024 A-3- 18

TEST TITLE: Space Shuttle Booster Heat Transfer Model Tests  
Mach 8 Variable  
TEST NUMBER: VD TUNNEL RUNS 123-135 TEST FACILITY: Density Wind Tunnel  
TEST DATE: 18 August 1970 TEST ENGINEER: W. R. Ginsky

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T <sub>aw</sub> * T <sub>total</sub>	RNX10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi$	X	Y	Z
1	B11	.0035	7.95	1415	1470	0.9	5.74	300	20	0	0			
2	B11				1495		5.58	500	20					
3	B2				1445		5.90	400	20					
4	B2				1455		5.84	500	20					
5	B11				1470		5.74	400	30					
6	B11				1490		5.62	250	30					
7	B12				1505		5.52	250	30					
8	B2				1485		5.65	400	30					
9	B2				1485		5.65	500	30					
10	B2				1520		5.44	250	30					
11	B11				1505		5.53	500	40					
12	B11				1500		5.55	250	40					
13	B12				1505		5.53	250	40					

\*\* X axis parallel to stream (+ downstream, - upstream)  
Y axis (+ right, - left, as viewed from the rear)  
Z axis (+ up, - down)

\* T<sub>aw</sub> = adiabatic wall temperature

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**PHASE CHANGE COATING TEST DATA SUMMARY SHEET**  
Table 2.

TEST TITLE: Space Shuttle Booster Heat Transfer Model Tests

TEST NUMBER: VD Tunnel Runs 136, 180-188 TEST FACILITY: Mach 8 Variable Density Wind Tunnel

TEST DATE: 24 August 1970 TEST ENGINEER: W. R. Ginsky

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T <sub>aw</sub> * T <sub>total</sub>	RNx106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi$	X	Y	Z
14	B2	0.0035	7.95	1415	1520	0.9	5.44	500	40	0	0			
15	B11				1470		5.74	500	50					
16	B11				1475		5.71	700	50					
17	B11				1465		5.77	250	50					
18	B2				1470		5.74	700	50					
19	B11				1480		5.68	700	60					
20	B11				1510		5.50	250	60					
21	B12				1510		5.50	250	60					
22	B2				1480		5.68	700	60					
23	B2	↓	↓	↓	1510	↓	5.50	250	60	↓	↓			

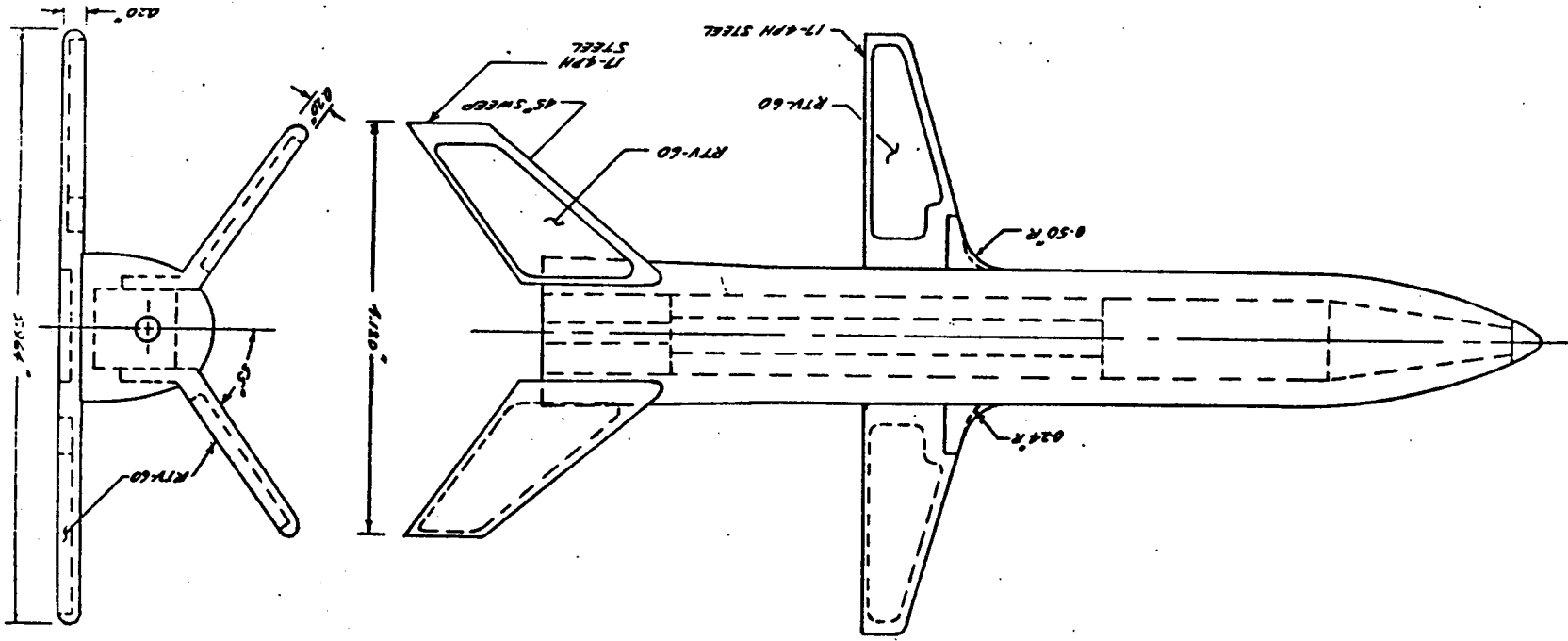
\*\* X axis parallel to stream (+ downstream, - upstream)  
Y axis (+ right, - left, as viewed from the rear)  
Z axis (+ up, - down)

\* T<sub>aw</sub> = adiabatic wall temperature

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DELTA WING BOOSTER  
GD/C  
DR#1024 A-3- 19

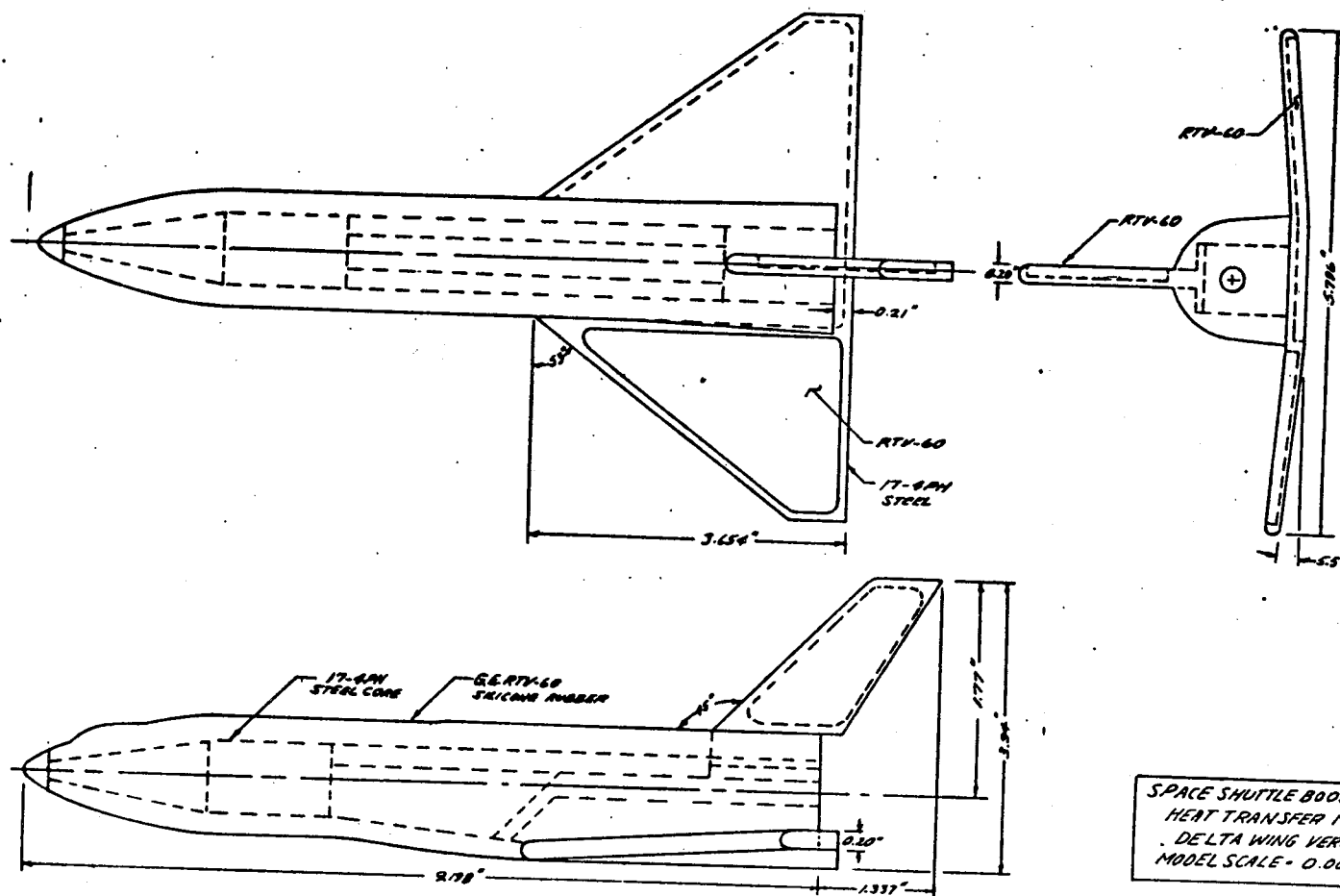
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DELTA WING BOOSTER  
GD/C  
DR#1024 A-3-20

SPACE SHUTTLE BOOSTER  
HEAT TRANSFER MODEL  
STRAIGHT WING VERSION  
MODEL SCALE=0.0035

Figure 1.



SPACE SHUTTLE BOOSTER  
HEAT TRANSFER MODEL  
DELTA WING VERSION  
MODEL SCALE = 0.0035

Figure 2.

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Table 4  
PHASE-CHANGE-COATING TEST DATA SUMMARY SHEET

DELTA WING BOOSTER  
GD/C  
DR#1070 A-3- 22

TEST TITLE: High Angle-of-Attack Space Shuttle Booster Heat Transfer Test

TEST NUMBER: Tunnel Run 703-766 TEST FACILITY: Mach 8 VDHWT

TEST DATE: Jan. 20-21, 1971 TEST ENGINEER: R. O. Doughty, R. C. Erickson

Run No.	Model Configuration Identification†	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°F)	T <sub>aw</sub> * T <sub>total</sub>	RNX10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi^\ddagger$	X	Y	Z
703	A	.0032	7.80	200	935	1.0	1.0	550	50		0			
704	A		7.80	203	900		1.01	300	50		0			
705	B		7.82	212	935		1.09	225	50		50			
706	D		7.82	210	925		1.08	225	50		-			
707	A		7.95	1470	1060		6.04	550	50		0			
708	B		7.95	1530	1045		6.20	450	50		50			
709	D		7.95	1500	1025		6.17	450	50		-			
710	A		7.95	1480	1042		6.05	350	50		0			
711	B		7.95	1480	970		6.05	250	50		50			
712	D		7.95	1480	1040		6.05	250	50		-			
713	A		7.81	208	890		1.06	450	40		0			
714	B		7.82	215	935		1.15	225	40		40			
715	D	.0032	7.80	205	920	1.0	1.04	225	40		-			

\*\* X axis parallel to stream (+ downstream, - upstream)  
Y axis (+ right, - left, as viewed from the rear)  
Z axis (+ up, - down)

\* T<sub>aw</sub> = adiabatic wall temperature

‡  $\phi$  = Angle of canard measured from free-stream (degrees)

† A - Delta-wing booster with pivoting canard and podded engines beneath the wings  
B - Delta-wing booster with fixed canard and no engines beneath the wings  
C - Delta-wing booster with contoured-steel pivoting canard; podded engines beneath wings  
D - Cylindrical booster with proper nose contour; no fairings, canards, or wings

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Table 4 (Cont'd)  
PHASE-CHANGE-COATING TEST DATA SUMMARY SHEET

Run No.	Model Configuration Identification†	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°F)	T <sub>aw*</sub> T <sub>total</sub>	RNx10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi^\dagger$	X	Y	Z
716	A	.0032	7.95	1490	980	1.0	6.12	700	40		0			
717	B		7.95	1495	1010		6.15	550	40		40			
718	D		7.95	1460	1070		6.00	450	40		-			
719	<del>K</del>		7.95	1480	980		6.05	550	40		40			
720	A		7.95	1490	1045		6.12	400	40		0			
721	B		7.95	1480	1025		6.05	250	40		40			
722	D		7.95	1450	990		6.00	250	40		-			
723	A		7.82	210	900		1.08	550	60		0			
724	B		7.82	215	925		1.15	300	60		60			
725	D		7.80	205	930		1.04	300	60		-			
726	A		7.95	1480	1055		6.05	700	60		0			
727	B		7.95	1490	1015		6.12	550	60		60			
728	D		7.95	1500	985		6.17	450	60		-			
729	A		7.95	1500	1015		6.17	400	60		0			
730	B		7.95	1460	1035		6.0	250	60		60			
731	D		7.95	1490	1035		6.12	250	60		-			
732	A		7.80	205	905		1.04	550	65		0			
733	B		7.81	208	915		1.06	300	65		65			
734	D		7.81	208	925		1.06	300	65		-			
735	A	.0032	7.95	1450	1065	1.0	6.00	700	65		0			

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DELTA WING BOOSTER  
GD/C  
DR#1070 A-3- 23

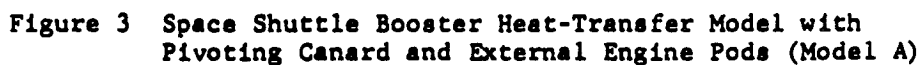
Table 4 (Cont'd)  
PHASE-CHANGE-COATING TEST DATA SUMMARY SHEET

Run No.	Model Configuration Identification†	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°F)	T <sub>aw</sub> * T <sub>total</sub>	RNX10 <sup>6</sup> Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									$\alpha$	$\beta$	$\phi^\dagger$	X	Y	Z
736	B	.0032	7.95	1480	1005	1.0	6.05	550	65		65			
737	D		7.95	1490	1030		6.17	450	65		-			
738	A		7.95	1420	1080		5.90	400	65		0			
739	B		7.95	1500	1015		6.17	200	65		65			
740	D		7.95	1490	1030		6.12	200	65		-			
741	A		7.95	1450	1055		6.00	125	65		35			
742	B		7.95	1450	1045		6.00	175	65		65			
743	A		7.95	1460	1010		6.00	150	65		35			
744	B		7.95	1480	1025		6.05	138	65		65			
745	C		7.82	212	930		1.09	138	65		0			
746	D		7.82	212	925		1.09	109	65		-			
747	C		7.95	1460	1045		6.00	175	65		0			
748	D		7.95	1480	1015		6.05	125	65		-			
749	A		7.95	1480	975		6.05	138	60		30			
750	B		7.95	1490	1040		6.12	138	60		60			
751	C		7.80	205	905		1.04	125	60		0			
752	D		7.80	200	915		1.00	109	60		-			
753	C		7.95	1460	1030		6.00	138	60		0			
754	D	.0032	7.95	1480	1055	1.0	6.05	125	60		-			

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Table 4 (Cont'd)  
PHASE-CHANGE-COATING TEST DATA SUMMARY SHEET

Run No.	Model Configuration Identification <sup>†</sup>	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°F)	$T_{aw}^*$ Total	$RNX10^6$ $\frac{F_t}{T_{aw}^*}$	Phase Change Temp. (°F)	Model Position (degrees)	Camera** Location (in.)	X	Y	Z
755	A	.0032	7.95	1490	1000	1.0	6.12	138	50	30			
756	B		7.95	1460	1025		6.00	138	50				
757	C		7.80	205	910		1.04	109	50				
758	D		7.82	212	910		1.09	109	50				
759	C		7.95	1490	1040		6.12	138	50				
760	D		7.95	1500	1025		6.17	125	50				
761	A		7.95	1480	995		6.05	138	40	20			
762	B		7.95	1460	1030		6.00	138	40	40			
763	C		7.81	208	900		1.06	109	40	20			
764	D		7.83	220	930		1.17	109	40				
765	C		7.95	1460	1035		6.00	138	40	20			
766	D	.0032	7.95	1490	1000	1.0	6.12	125	40				





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DELTA WING BOOSTER  
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DR#1070 A-3-27

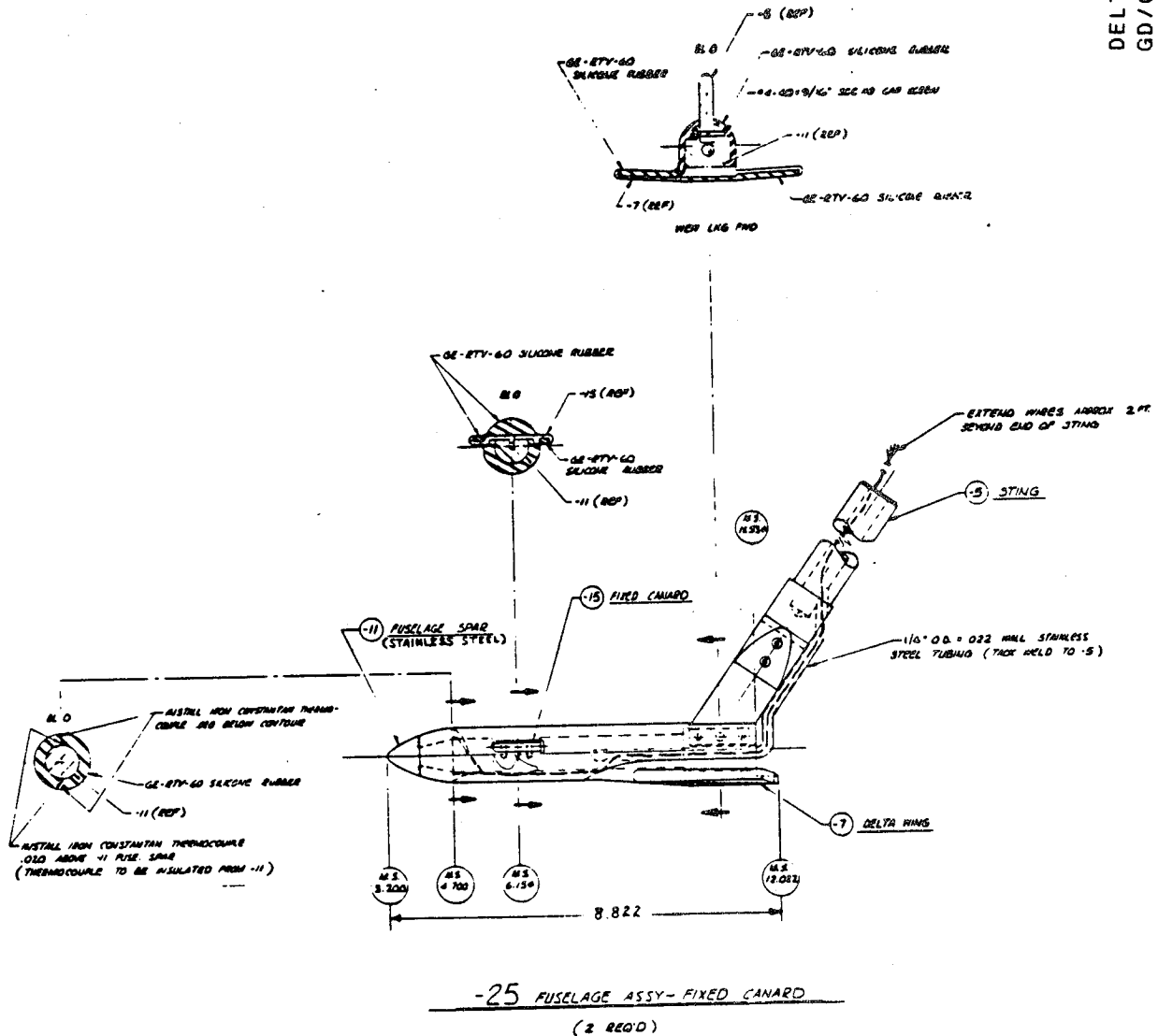


Figure 4 Space Shuttle Booster Heat-Transfer Model with Fixed Canard and without External Engines (Model B)

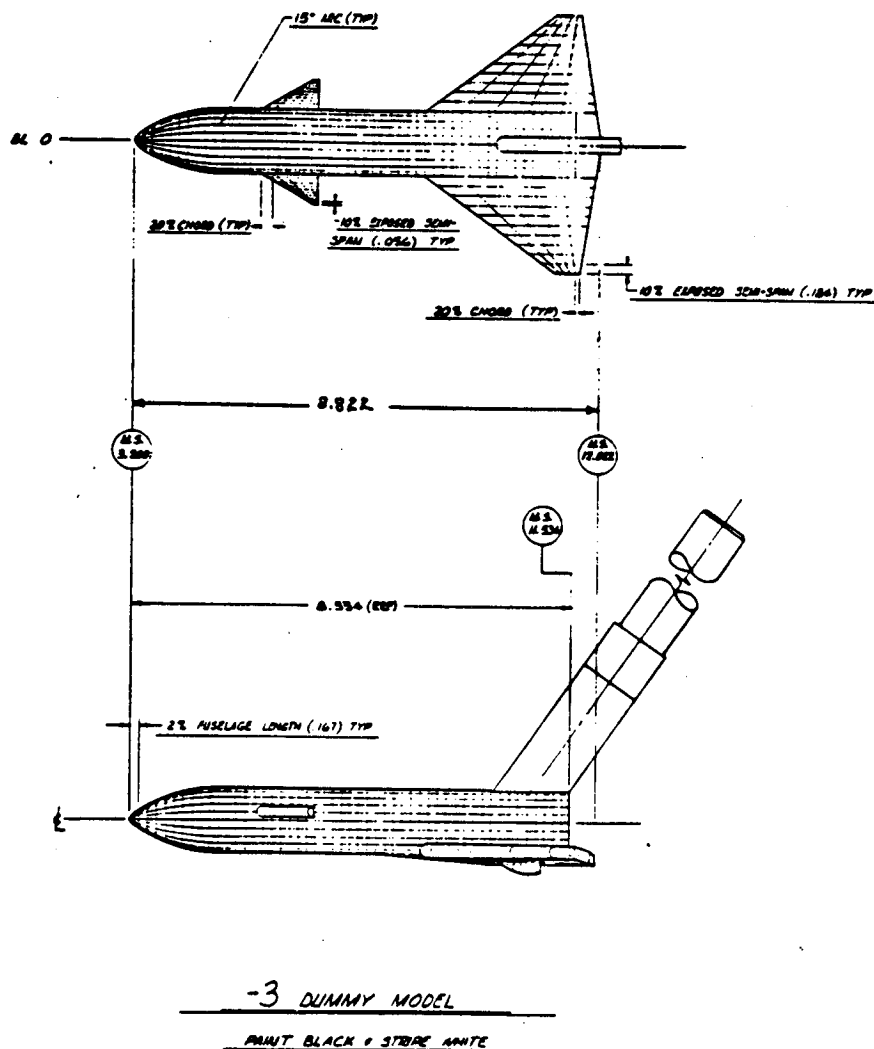


Figure 5 Space Shuttle Booster Grid Model

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TABLE III  
RUN SCHEDULE  
DELTA-WING BOOSTER

(Test 105 Runs 21-38)

$M = 7.4$

Run	$\alpha$ , deg	$Re_{\infty, L}$
21	-5	$0.90 \times 10^6$
22	↓	4.88
23	0	.86
24	↑	1.83
25		3.48
26		4.60
27	10	4.85
38	20	4.21
28	30	.99
29	↑	1.81
30		3.22
31		4.58
32	40	4.45
33	50	4.82
34	60	.94
35	↑	1.95
36		3.41
37		4.93

$L = 0.410$  meter (16.128 in.)  
0.006 model scale

DELTA WING BOOSTER  
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DR#1179 A-3- 29

DELTA WING BOOSTER  
GD/C  
DR#1179 A-3- 30

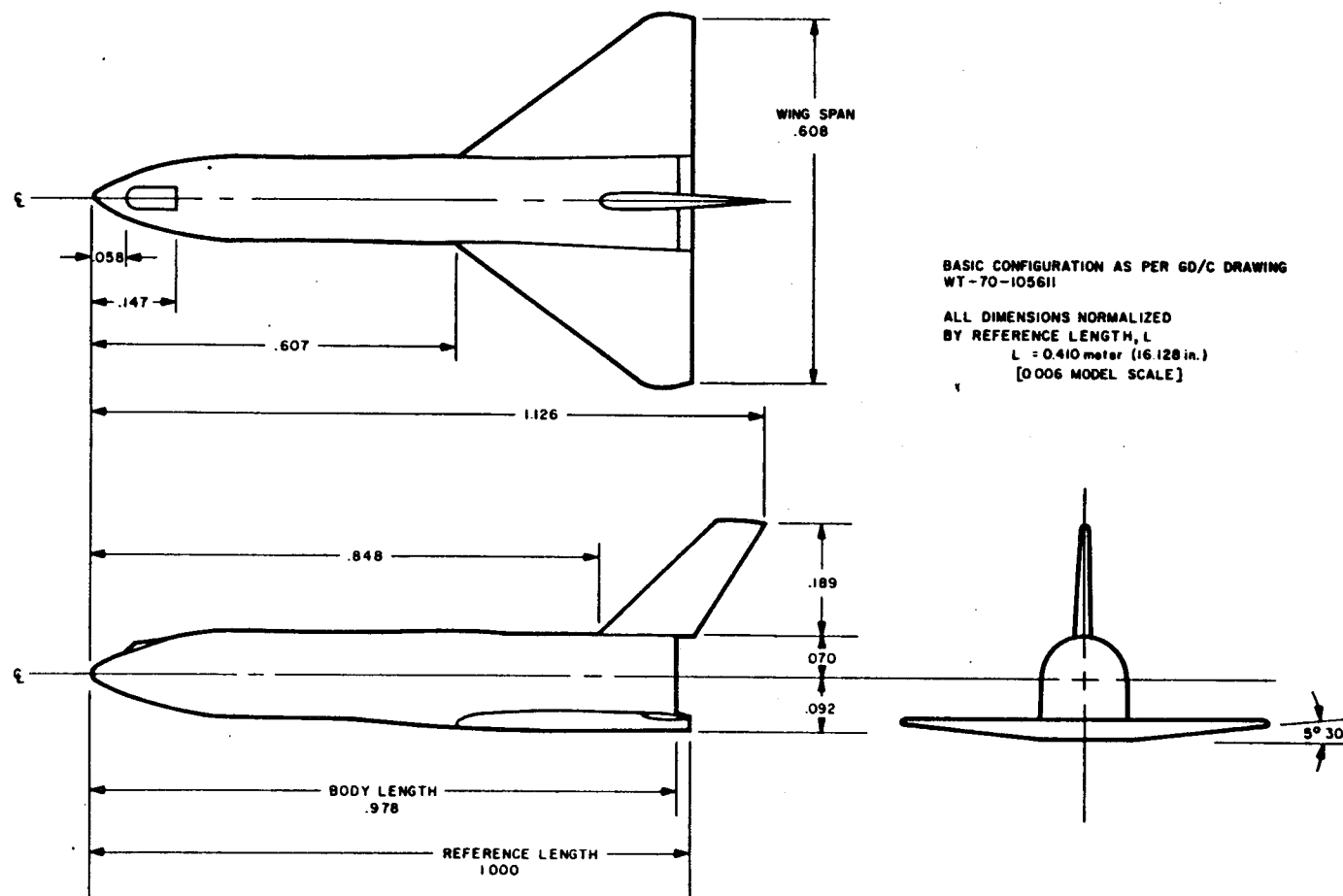
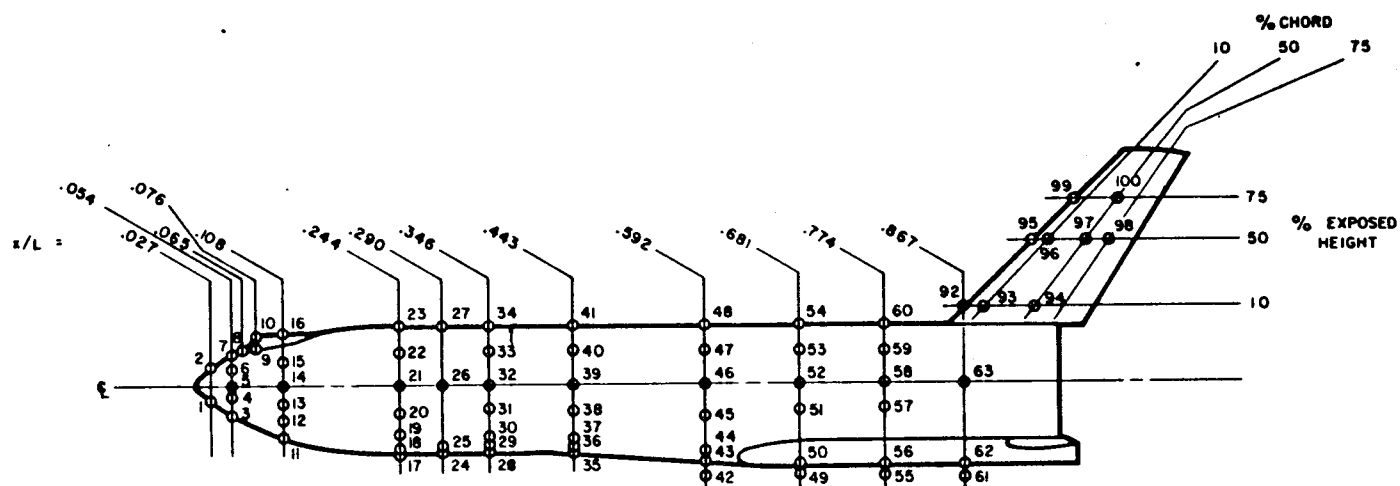


Figure 2.- Dimensioned sketch of delta-wing booster model.

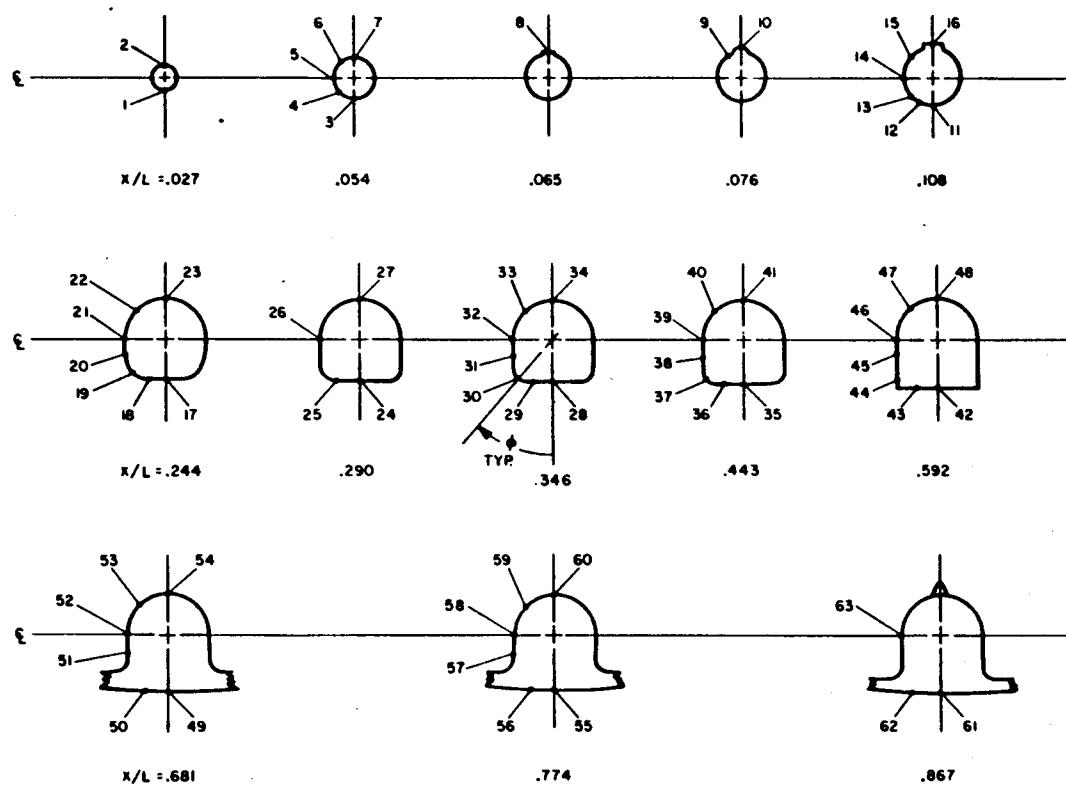


(a) Body and vertical tail.

Figure 3.- Thermocouple locations on delta-wing booster model.

**Figure 3.- Continued.**

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(c) Body cross sections.

Figure 3.- Concluded.

DELTA WING BOOSTER  
GD/C  
DR#1179 A-3- 33

Table 4. Phase Change Paint Test Data Summary

Run No.	Model Configuration*	Free Stream Mach No. M <sub>∞</sub>	Tunnel Total Pressure P <sub>0</sub> (psia)	Tunnel Total Temp. T <sub>0</sub> (°F)	Free Stream Reynolds No. Re <sub>∞</sub> /ft×10 <sup>6</sup>	Angle of Attack α (Deg.)	Phase Change Temp. T <sub>pc</sub> (°F)	Model Initial Temp. T <sub>i</sub> (°F)	h <sub>r=1</sub> <sup>†</sup> Btu/ft <sup>2</sup> -sec-R	Remarks
1	A	6	345	422		40	350	70		Canard on, δ = -40°**
2	B		345	390		40	325	69		
3	A		340	400		40	300	79		
4	B		515	434		40	300	64		
5	A		340	410		60	325	63		Canard on, δ = -60°
6	A		170	400		60	250			Model not retracted prior to run
7	A		515	406		60	325	65		Canard on, δ = -60°
8	A		170	410		60	250	73		
9	C		515	415		60	325	69		
10	D		515	406	9.67	60	300	70	0.1448	Canard off
11	A		515	405	9.68	60	300	70	0.1448	Canard on, δ = 0°
12	B		520	404	9.80	60	300	68	0.1455	Canard on, δ = -60°
13	A		520	412	9.65	0	300	73	0.1457	Canard on, δ = 0°
14	D		520	410	9.69	0	250	75	0.1459	Canard off
15	A		345	400	6.55	0	250	72	0.1186	Canard on, δ = 0°
16	C		520	410	9.69	20	250	71	0.1459	Canard on, δ = -20°
17	A		168	445	2.93	0	250	67	0.0833	Canard on, δ = 0
18	A		520	426	9.41	20	250	72	0.1462	Canard on, δ = -20°
19	A		521	408	9.74	40	300	70	0.1457	Canard on, δ = -40°
20	C		520	411	9.67	40	325	68	0.1455	

\* A - Baseline

B - Baseline with blunt nose

C - Baseline with high wing

D - Baseline with ABES pods

\*\* δ measured with respect to the freestream

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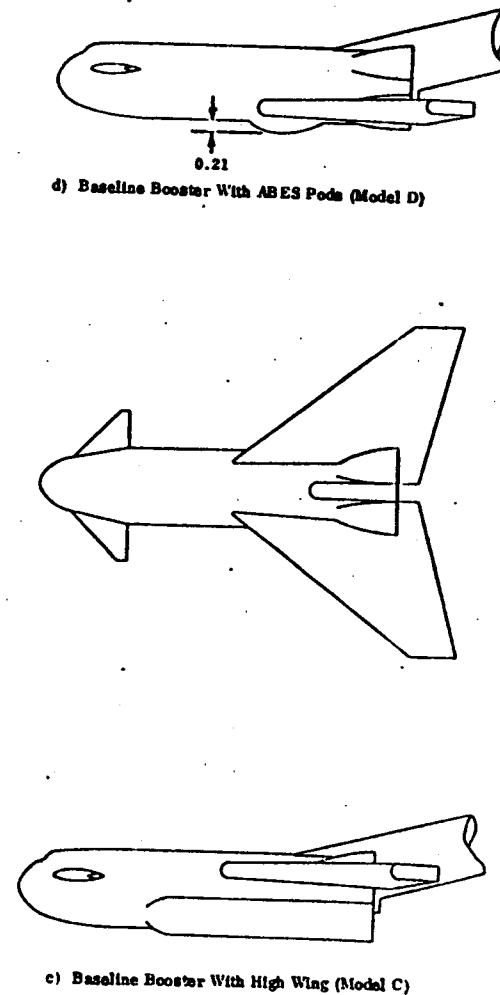
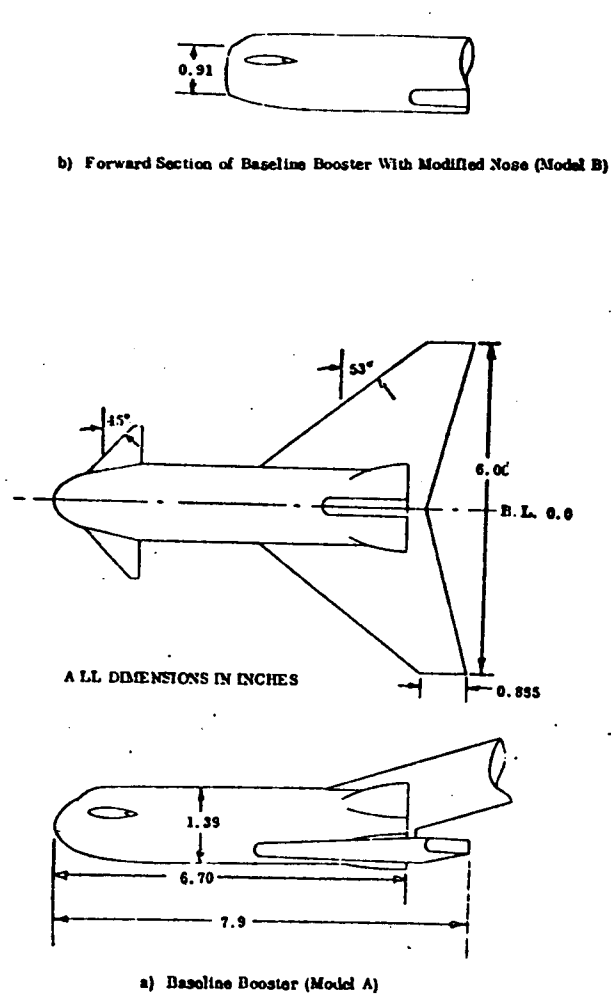


Figure 1. Models Configuration

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TABLE B-I.- RUN COLLATION TABLE

$Re_{\omega,L}$ $\times 10^{-6}$ nominal	$Re_{\omega,L}$ $\times 10^{-6}$ actual	Angle of Attack, $\alpha$ , deg							
		-5	0	10	20	30	40	50	60
1	0.90 0.95 0.96 1.07		5				11		17
2	2.01 2.18 2.35			6			12		18
3.5	3.36 3.64 3.73		7			13			19
5	4.70 4.90 4.95 5.05 5.08 5.26 5.52	4	8		10		15		
				9		14		16	
									20
7	7.13 7.16 7.43		39			43			48
10	9.54 9.62 9.68 9.78 9.86 9.95		40	41	42	44	45	46	47

TABLE B-II.- THERMOCOUPLE COLLATION TABLE

(a) BODY

Nondimensional Axial Distance x/L														
$\phi$ , deg	.025	.050	.061	.071	.102	.222	.306	.403	.499	.548	.612	.722	.773	.897
0	1	3			11	17	21	28	30			41	49	52
18												42		
23														53*
25						18	22	29	31					
36												43		
40									32					
45							23			37		44		
65											39			
70									33			45		
90						19	25		34	38		46	51	54
135							26		35			47		
180	2	7	8	10	16	20	27		36			48		

Note: \*Runs 3 - 18 only  
 'Runs 18 - 20 and 39 - 48 only

STRAIGHT WING BOOSTER  
 GD/C  
 DR#1134 A-3- 37

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TABLE B-II.- Concluded

## (b) WING

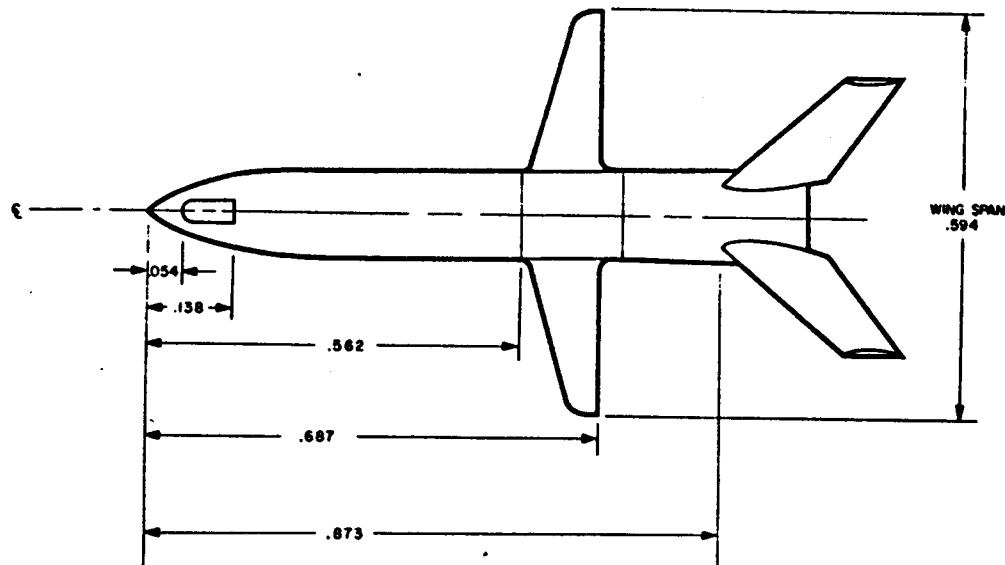
		Percent Exposed Semispan						
Percent chord		4	15	22	32	45	60	75
Leading edge	0	55		61		68		78
Top Surface	10	56			63			
	42							79
	50		58					
	75					70		
Bottom Surface	10	57		62	64	71	75	80
	36				65			
	39					72	76	
	50		59					
	53					73		
	75		60		67	74	77	

Note: Left and right wing treated as one - all runs made with  $\beta = 0^\circ$

## (c) TAIL

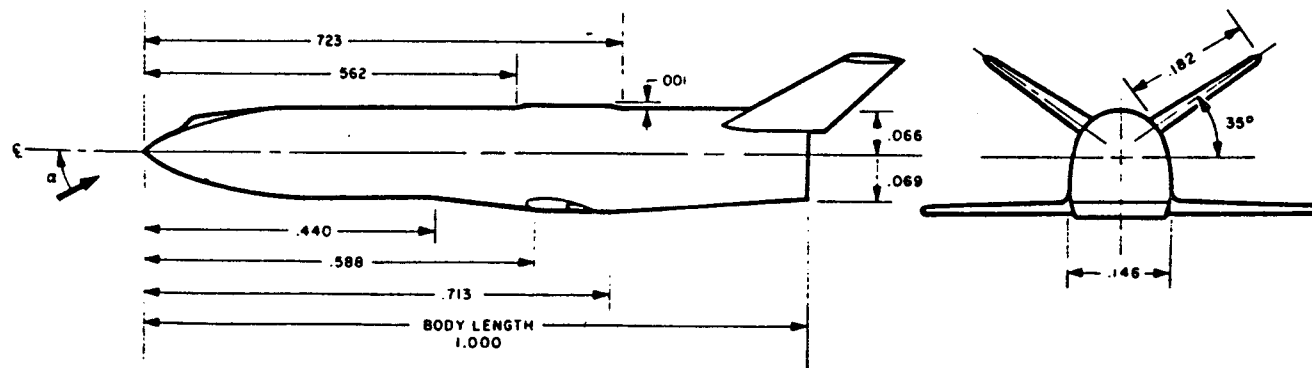
		Percent Exposed Semispan				
Percent chord		14	28	42	59	75
Leading edge	0	82		88		96
Bottom Surface	10	84	87	92	95	98
	50	85		93		99
	75	86		94		100

Note: Left and right tail treated as one - all runs made with  $\beta = 0^\circ$



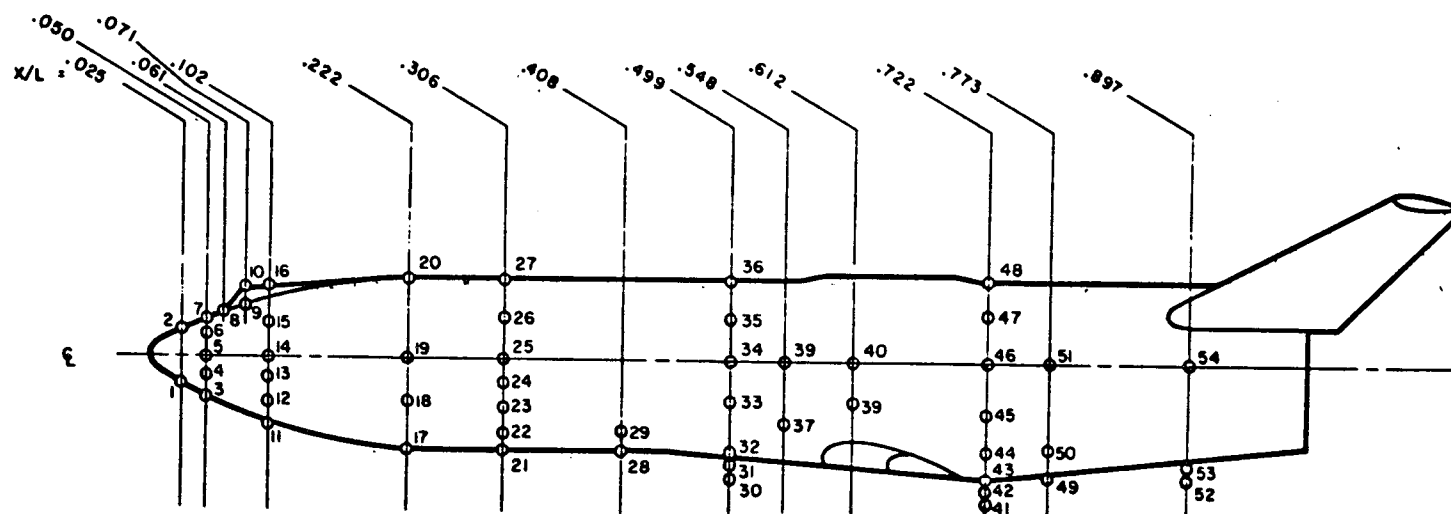
BASIC CONFIGURATION AS PER GD/C DRAWING  
WT-70-105601

ALL DIMENSIONS NORMALIZED BY BODY  
LENGTH, L  
L = 0.437 meter (17.208 in.)  
(0.006 MODEL SCALE)



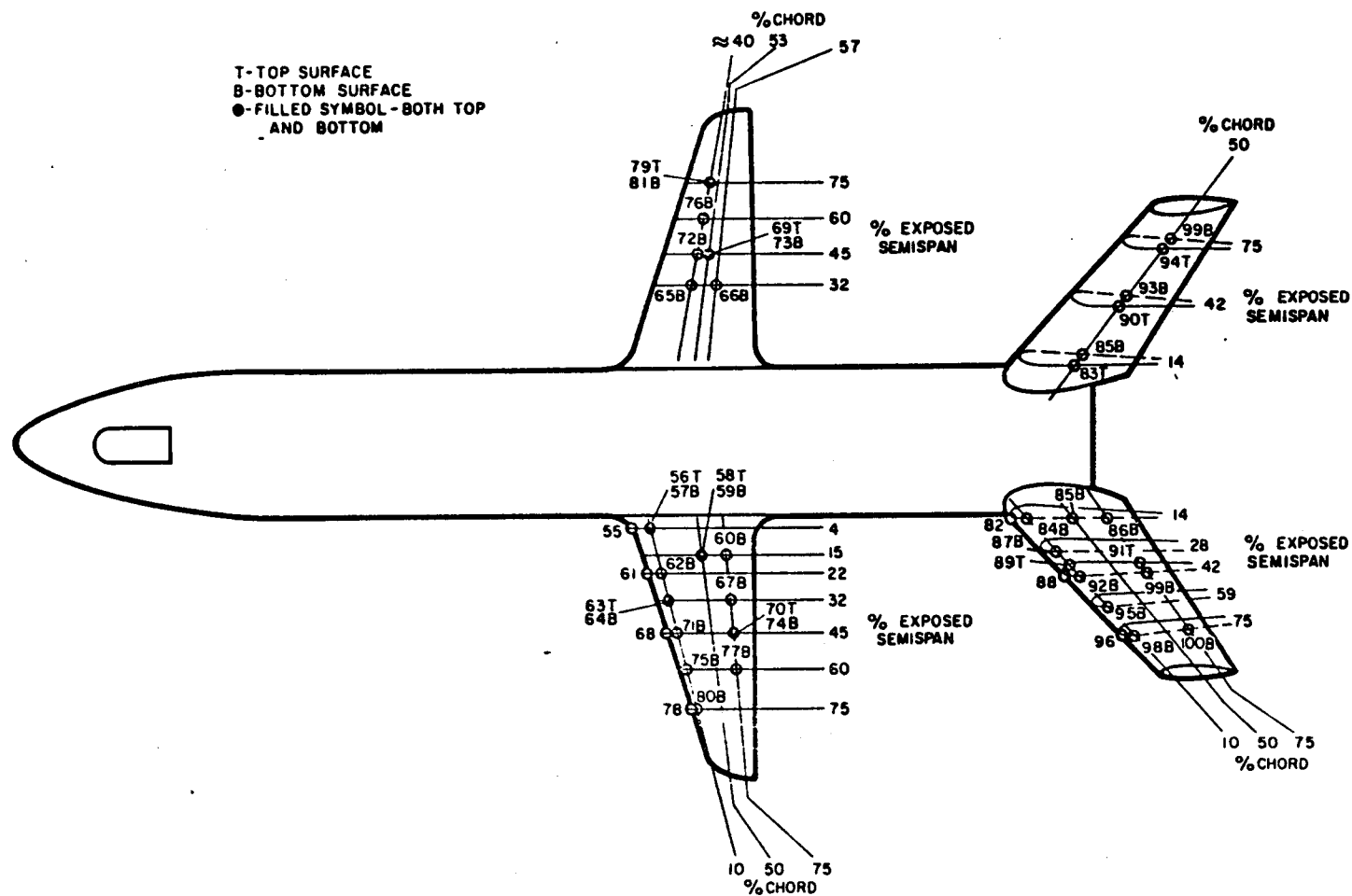
Sketch 1.- Dimensioned sketch of straight-wing booster model.

STRAIGHT WING BOOSTER  
GD/C  
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(a) Body.

Sketch 2.- Thermocouple locations on straight-wing booster model.



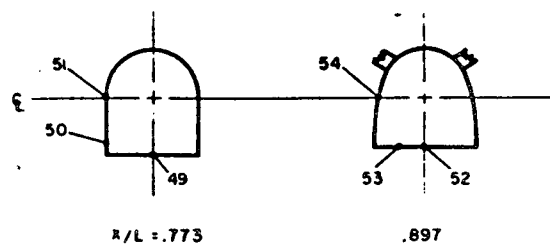
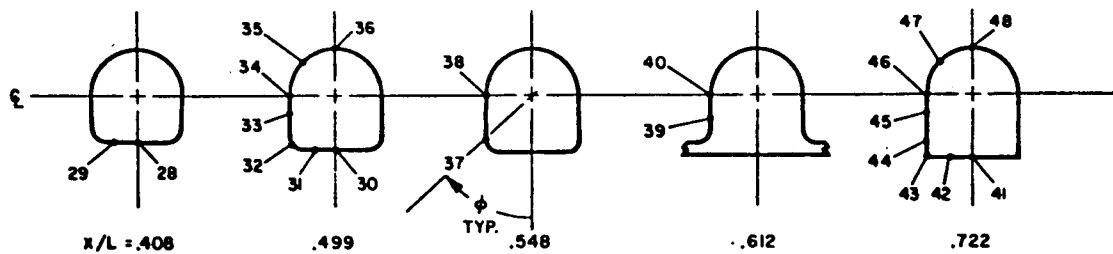
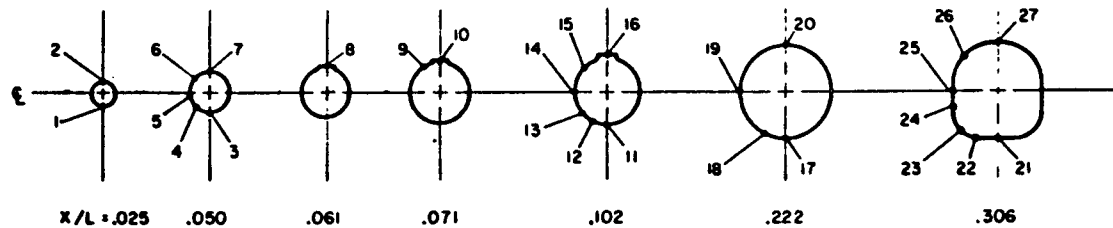
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(b) Wing and vee tail.

Sketch 2.- Continued

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STRAIGHT WING BOOSTER  
GD/C  
DR#1134 A-3- 41



NOTE: ALL SECTIONS AS VIEWED  
FROM REAR OF MODEL  
ξ AT W.L. 7.200  
BODY SECTIONS AS PER  
GD/C DRAWING WT-70-105604

(c) Body cross sections.

Sketch 2.- Concluded

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# Standard Bibliographic Page

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16. Abstract  Archived wind tunnel test data are available for flyback booster or other alternate recoverable configurations as well as reusable orbiters studied during initial development (Phase B) of the Space Shuttle. Considerable wind tunnel data was acquired by the competing contractors and the NASA centers for an extensive variety of configurations with an array of wing and body planforms.  All contractor and NASA wind tunnel test data acquired in the Phase B development have been compiled into a database and are available for applying to current winged flyback or recoverable booster aerodynamic studies.  The Space Shuttle Phase B Wind Tunnel Database is structured by vehicle component and configuration type. Basic components include the booster, the orbiter and the launch vehicle.  Booster configuration types include straight and delta wings, canard, cylindrical, retro-glide and twin body.  Orbiter configuration types include straight and delta wings, lifting body, drop tanks and double delta wings.  Launch configuration types include booster and orbiter components in various stacked and tandem combinations.					
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